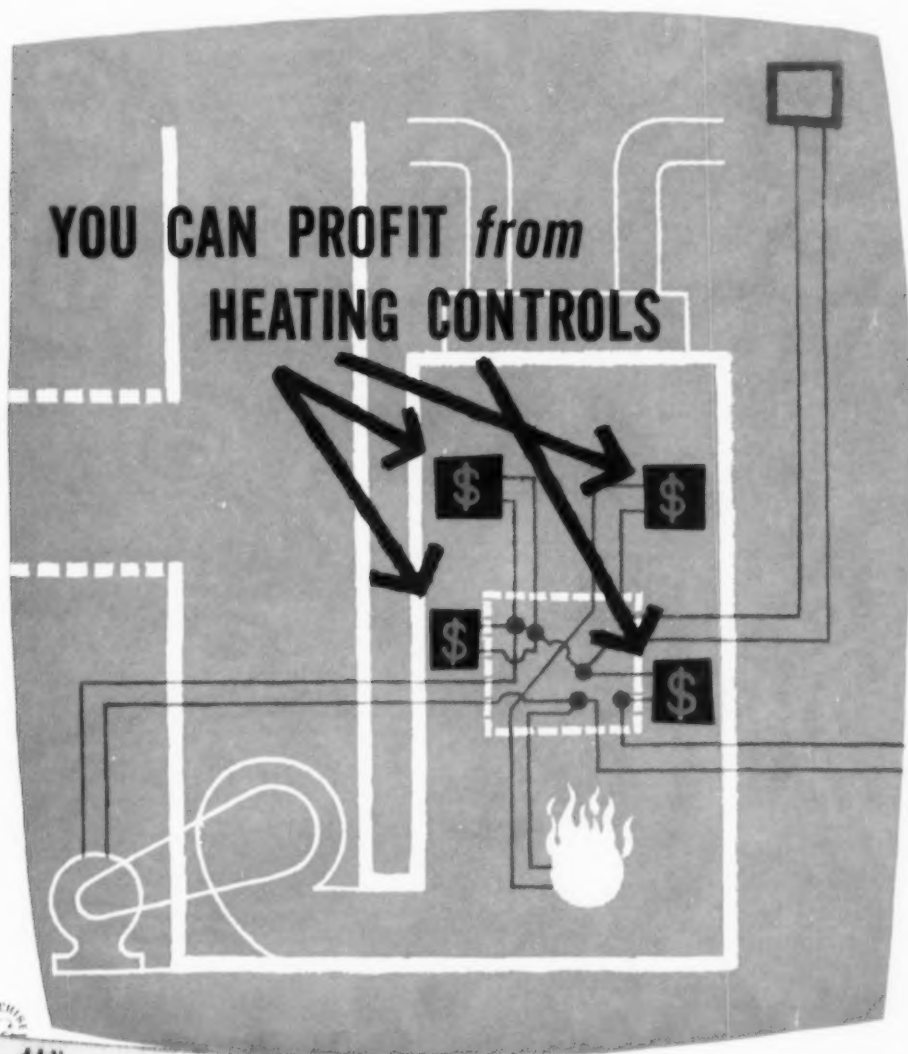


# Commercial Refrigeration & Air Conditioning

July 1957



315 N FIRST ST  
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UNIVERSITY MICROFILMS  
RIF

to find out how, turn to page 92

**Circulation now over 30,000**

## SOARING TO NEW HEIGHTS

It's up, up, up at Copeland . . . a continuous record of progress in every phase of the manufacture and distribution of highest-quality refrigeration units.

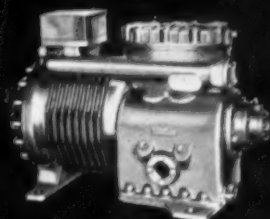
A new factory lifts our production to new heights of distinction. It also speeds up complete parts and replacement service. Thus all who handle and use Copeland equipment greatly improve their inventory position and can free working capital previously tied up.

The future grows brighter all the time for our coast-to-coast network — 25,000 dealers working with nearly 150 Copeland wholesalers and more than 500 manufacturers using Copeland-powered equipment.

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**Copeland**  
REFRIGERATION

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COPELAMETIC  
MOTOR-COMPRESSORS



COPELAMETIC  
CONDENSING UNITS



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spots**

**ALCO 402**

**the small-fixture Thermo Valve**

Prevents motor overload.

May be installed in any position—  
even upside down—  
in or out of the refrigerated area.  
It's liquid charged.



choose from these convenient sizes:

Freon-12— $\frac{1}{4}$ ,  $\frac{1}{2}$  and 1 ton

Freon-22—.4, .8 and 1.6 tons

Methyl-Chloride— $\frac{1}{2}$ , 1 and 2 tons

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**WITH THE NEW**

**EASIER-TO-INSTALL BODY**

**ENGINEERED FOR SERVICE ENGINEERS**

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Regulators; Solenoid Valves;  
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7025

# THE CASE OF THE HAPPY REFRIGERATION SERVICE ENGINEER

BY ROLLO-TUBE



Once upon a time, in a big city, there lived a man named Henry.

To look at Henry you'd have thought he had it made. In business for himself . . . owned a couple of trucks . . . employed a couple of journeymen . . . named Pete and Joe . . . and had a nice little shop right back of his own home.

But you know something? Henry wasn't happy. He was really worried. When he bid on that refrigeration and air conditioning project on the east side of town, he'd really thought he could handle it.

It wasn't that Pete and Joe weren't good men. They had both been with him since he first started in business. But right now—doggone it—it was taking too much time to make installations.

Multiply their time by 14 installations—and yikes!—he was in a fair way to lose his shirt. But—like most of us—Henry had a "Good Angel" and right about then his Good Angel figured it was time to give Henry a helping hand.



That's why, on the very next day, a greatly puzzled Pete came to Henry with a complaint. "Hey Boss," he said, "I can't understand it. I would have sworn there was lots of solder in the truck when we pulled out this morning. Now me and Joe only got enough to last until noon. I can't figure it out no how." Actually there was lots of solder in the truck but the Good Angel had shoved it under the seat. On top of his troubles this jarred Henry but all he said was, "OK, Pete, I'll go down to the wholesaler and get some more."



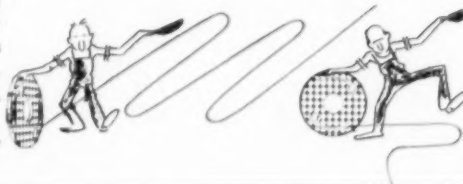
As Henry was waiting for the counterman to fill his order, his Good Angel really went to work. "Here's your solder, Henry," said the counterman. "Now, how are you fixed for tube? I hear you got that refrigeration and air conditioning project. You should try Wolverine Roll-O-Tube® for that job. You'll save a lot of time because you can use the carton as a reel. All you do is fasten the tube at one end and reel the carton back. It's fast and easy to use."



Henry took a good look at the carton the counterman was holding and right away could see the possibilities. "Man," he said, "this Roll-O-Tube looks like it could be what I need."

"Now, maybe we can make enough time to come out on top of that job—just like I figured."

Henry filled the back of the truck with Roll-O-Tube and took off. And you know something? It worked! Using Roll-O-Tube as a reel, they installed refrigeration tube faster and easier than ever. They discovered they could save time other ways, too. Because Roll-O-Tube could be rolled, or easily carried by its center hole, it made tube handling a lot faster. They liked its easy opening and the way they could leave the unused tube in the carton. They liked the Wolverine Tube seal too—the fact that it could be re-used, and it allowed for ease of threading through partitions.



Joe, who was a real quiet guy most of the time said, "Hey, Boss, how come we never used Roll-O-Tube before!"

And Henry said, "I've been asking myself the same thing. Somehow, I feel just like a Good Angel had led me to Roll-O-Tube—right when I needed it most. Of course that's crazy!"

And right over Henry's right shoulder—where he liked to fly most of the time—Henry's Good Angel laughed and laughed and laughed.

**BUY FROM  
YOUR  
WHOLESALER**



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PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES

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Circle No. 4 on Reader Service Card

# Commercial Refrigeration & Air Conditioning

JULY 1957 • Vol. 14 • No. 7

## 46/Make Your Servicemen Proud of Their Job

Here's how one commercial refrigeration distributor combines training, compensation, and recognition into an integrated program that makes his service department a top-profit activity.

## 48/Give 'Em Air . . . and plenty of it!

Two 30,000 cfm ventilating systems provide efficient and economical operating conditions for the 28 air cooled condensing units handling the refrigeration requirements of this new supermarket.

## 50/"Problem Engineering" Pays Off

Advance planning helps this Denver contractor meet the special—and specific—needs of his supermarket customers. Result: a growing reputation that builds more business, bigger profits.

## 52/5 Ways You Can Lick the Defrosting Problem

One of these five common methods of defrosting direct expansion ammonia and isolated brine coils in commercial coolers and freezers may be just the answer for your next cold storage job.

### Departments:

*Calendar of Events/14*

*About People/28*

*As We See It/32*

*Btu's/45*

*Useful Literature/57, 98*

*New Products/60, 102*

*Here's How/113*

*Contractors/116*

*Applications Manual/122*

*Index of Advertisers/128*

### AIR CONDITIONING SECTION

## 83/Comfort Engineering

Will this new concept open the door to a real sales boom for residential air conditioning? This article is "must" reading for sales-minded men.

## 86/Room Coolers Turned the Trick

. . . for this New Orleans office equipment dealer who needed air conditioning to keep his customers comfortable while shopping the store's furniture display floor.

## 87/What's a Thermosiphon?

It's a cold vapor heating system in which a refrigerant is used in place of water in the radiator coils. This article highlights its applications and its advantages.

## 88/Three Keys to Heat Pump Efficiency

Careful analysis showed that the three major factors required for most efficient and economical heat pump operation were present in Tacoma, Wash., so equipment of this type was selected to provide year-round air conditioning for the city's new utility building.

## 92/Heating Control Equipment

The sale, maintenance, and modernization of heating controls can mean extra dollars in the pocket of the contractor or dealer engaged in year-round air conditioning work.



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that  
equipment  
running...



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Next time an equipment cold line job

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# PERFECT PAIR FOR LONGER WEAR ...and smooth refrigerant flow!



## CHASE® copper refrigeration tube and solder-joint fittings!

Here's a cool couple: Chase Copper Refrigeration Tube and Chase Wrought Copper Solder-Joint Fittings. Together, they're the basis of refrigeration and air-conditioning systems that combine the utmost in durability and dependability.

Close O.D. and I.D. tolerances assure uniform expansion and contraction. No rough shoulders or surfaces to slow down circulation — coolants flow smooth and easy, *always!*

Your nearby Chase wholesaler stocks Chase extra-soft Refrigeration Tube, Chase TYPE L Copper Water Tube and Wrought Copper Solder-Joint Fittings to meet your every need. He's the man to contact before starting your next installation!

### *The Nation's Headquarters for Brass, Copper and Stainless Steel*

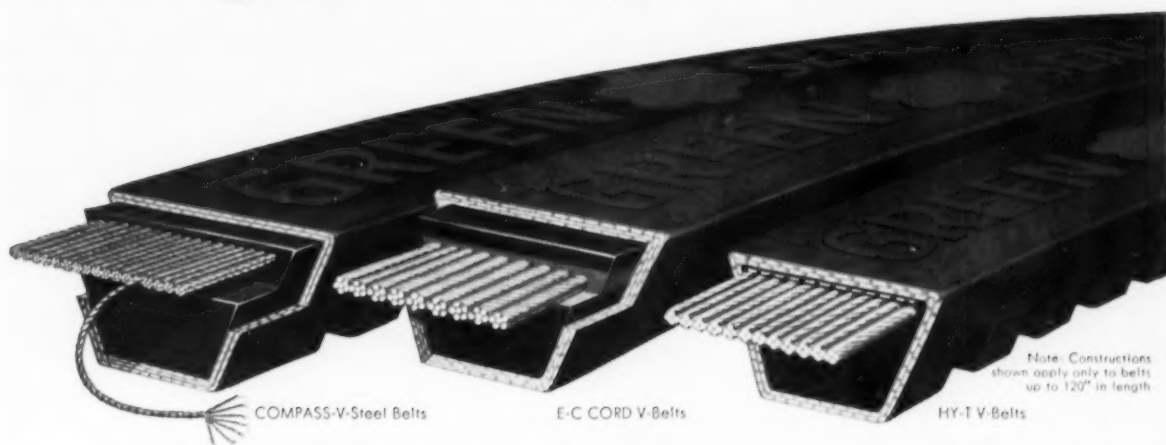
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The end result is smoother, longer-running teams of belts that give you maximum, trouble-free, horsepower hours at minimum cost. What better reason for specifying V-belts with the Green Seal?

**DIMENSIONALLY STABLE V-BELTS with the GREEN SEAL by**

**GOOD YEAR**  
THE GREATEST NAME IN RUBBER

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Please send me more information about how V-Belts with the Green Seal solve the major problem in belting multiple V-belt drives.

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NO  
COSTLY  
WATER BILLS

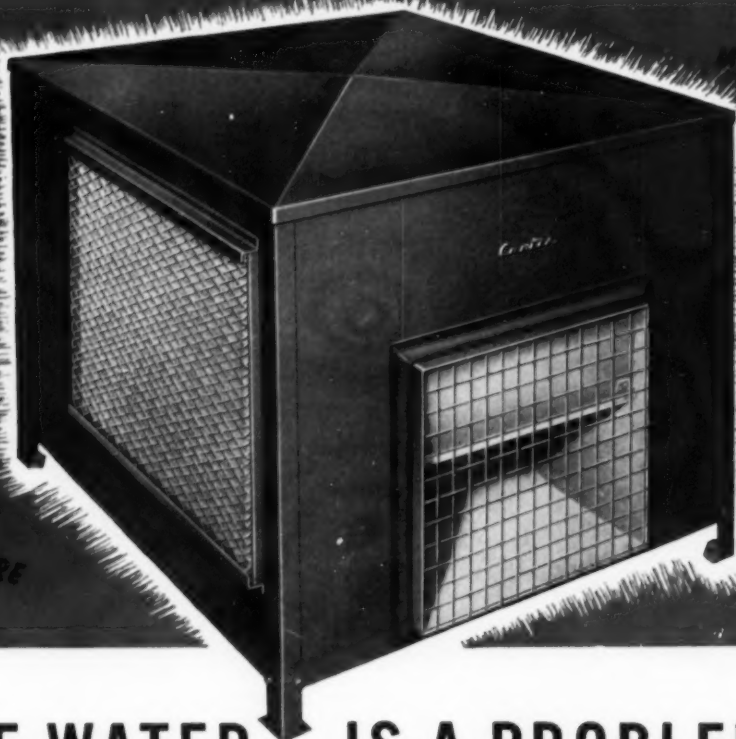
NO WATER  
PUMP NEEDED

NO  
UNSIGHTLY  
WATER TOWER

WATER  
PROBLEMS ARE  
ELIMINATED

LOW  
MAINTENANCE  
COST

INEXPENSIVE  
TO INSTALL



## WHERE WATER IS A PROBLEM

**Curtis** HAS THE ANSWER

For More Profits... More Customer Satisfaction  
with NEW CURTIS Waterless Air Conditioning Unit

The new, improved Curtis packaged, waterless, air-cooled air conditioning unit is designed to build sales for *you*—to give *your* customers *more* for their money.

**ALL NEW ALUMINUM SHELL** will *not* rust, is extremely lightweight, lasts forever.  
**NEW PERMANENT, COLORWELD FINISH** will *not* peel or chip, requires *absolutely* no maintenance.

**COVERED BY 5 YEAR PROTECTION PLAN.**

### COSTS LESS TO INSTALL AND TO OPERATE

No tower required. In majority of jobs, existing duct work can be used. No expensive piping needed. No water bills to pay. Does away with *all* water problems.

Every Curtis unit is backed by 103 years of experience and skill. Curtis has a complete, flexible line of air conditioning equipment—nationally advertised to help you sell.

CAN COUNT ON  
REMEMBER...  
YOU

**Curtis**

OUR 103rd YEAR

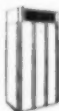
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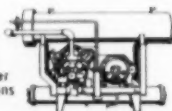
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CM-17

Packaged  
Air Conditioning Units  
3 thru 50 tons



Packaged  
Liquid Chiller  
7½ to 100 tons



Condensing Units  
Up to 100 tons  
F-12 or F-22



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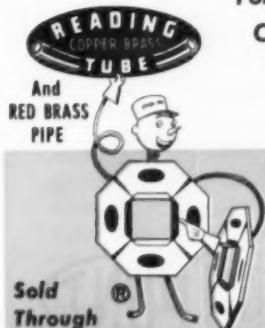
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## A Bonus of Dependability with Every Inch!

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For PEACE of MIND and  
Customer GOOD WILL—  
Be sure to specify  
**READING!**



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Only



Soft tempered for  
easy forming  
Dehydrated

Crimped  
ends seal  
out all  
moisture  
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Handy,  
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JULY, 1957 • COMMERCIAL REFRIGERATION

SO HALSTEAD & MITCHELL ENGINEERS SAID:

**NOW - YOU CAN BUY  
AN AIR-COOLED  
CONDENSER  
WITH LIFETIME  
HIGH CAPACITY**

**TURBU-FLO FINNED COILS WON'T CLOG**



Here is the industry's finest air-cooled condenser using the exclusive non-clog "Turbu-Flo" finned coil. In this most efficient Halstead & Mitchell design, wide fin spacing prevents

the coil clogging with air-borne dirt and other particles which cause a quick loss in condenser capacity. Thus, Halstead & Mitchell's high condenser capacity is built-in, for lifetime operation.

As a best starting point, Halstead & Mitchell uses a generously big coil, with fins spaced 6 to the inch. This means a low pressure drop, which in turn means high operating efficiency. The "Turbu-Flo" fin itself contributes to an extra-measure of heat transfer, providing a marked turbulence of air flow over the finned surface. This results in increased heat transfer due to lowered air film resistance. Thus, there's a generous reserve of capacity in these Halstead &

Mitchell Air-Cooled Condensers—capacity which will stay high for the life of the unit.

The exceptionally rugged construction, the manifold for easy multi-circuiting, and the right price make Halstead & Mitchell air-cooled condensers preferred by contractors everywhere. More details are yours for the asking—write for free Condenser Bulletin. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

AT LEADING WHOLESALERS EVERYWHERE



# ALL NEW

# 7

# Westinghouse



**NEW GAS-FIRED BASEMENT UNITS**  
Input capacities from 85,000 to 200,000 BTU/Hr.



**NEW GAS-FIRED COUNTERFLOW UNITS**  
Input capacities from 85,000 to 125,000 BTU/Hr.



**NEW OIL-FIRED BASEMENT UNITS**  
Benson output capacities from 85,000 to 134,000 BTU/Hr.

Now, an all-Westinghouse gas and oil-fired heating line that's designed with air conditioning in mind . . . gives Westinghouse Dealers 2 sales opportunities instead of 1! New Westinghouse furnaces are engineered to complement the new '57 air conditioners. Styled in the same smart two-tone color combination, they are natural "Profit-Mates." They give you all the advantages of automatic home heating—plus, the quality-mark of Westinghouse.

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**ECONOMY**—low in initial cost, surprisingly low in day-to-day operating costs. Precast ceramic combustion chamber, sectional heat exchanger, modified ribbon burner design, pressure-atomizing oil burner, and radiation cabinet liner all combine to give maximum heat with minimum fuel.

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**QUIET**—full cabinet insulation, resiliently mounted blower and oil burner, hydraulic-silent gas valve, ignitor burner hood, flexible heat exchanger make Westinghouse furnaces *whisper-quiet*.

**STYLE**—finished in beige and charcoal. They are perfect color-mates for the new Westinghouse cooling units

. . . harmonize with the decor of finished basement and utility rooms. Ripple finish resists scratching and marring.

**AUTOMATIC**—temperature control at the touch of the thermostat . . . delivers desired temperature year-round—safely. (Thermostats are optional for heating or year-round use.)

**SERVICEABLE**—lift-lock panels and observation port (in oil-fired units) give easy access to all components. Permit fast servicing and periodic inspection of all units.

**PREWIRED**—all controls are factory-wired and tested. Oil-fired units are delivered with factory-installed wiring harness for fast, simple installation.

**WARRANTED**—you get all the quality that Westinghouse stands for; plus a liberal 10-year warranty on the heat exchanger and a 1-year warranty on the complete unit.

## A Furnace for Every Location!

### NEW BASEMENT UNITS



—gas or oil-fired . . . amazingly compact, you'll find them ideal for installations where overhead clearances are limited.

### NEW UTILITY UNITS

—gas or oil-fired . . . they are "File-Cabinet-Size." Approved for zero clearance installations in closets or utility rooms.



### NEW COUNTERFLOW UNITS



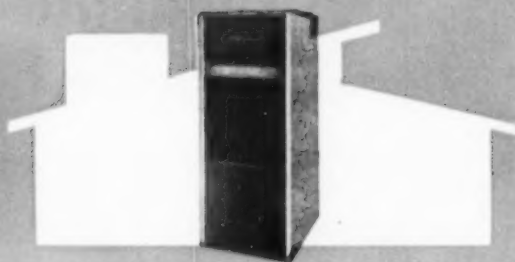
—gas or oil-fired . . . specially engineered for perimeter type residential heating systems. Can be easily installed in closet or any out-of-the-way space.

### NEW HORIZONTAL UNITS

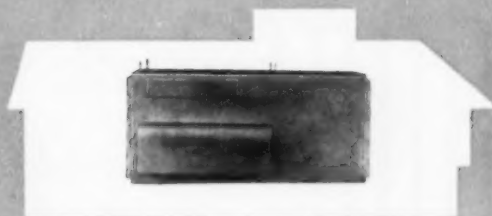
—gas-fired . . . need no floor space. Can be installed in attics, crawl spaces or basements.



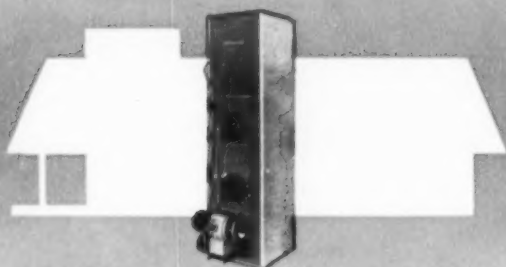
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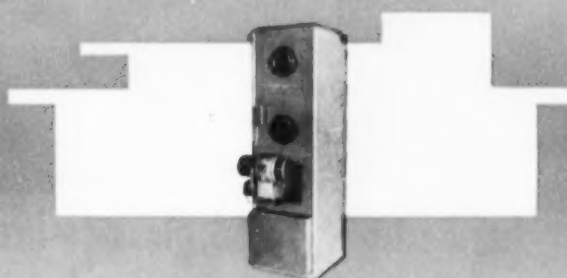
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Input capacities from 85,000 to 150,000 BTU/Hr.



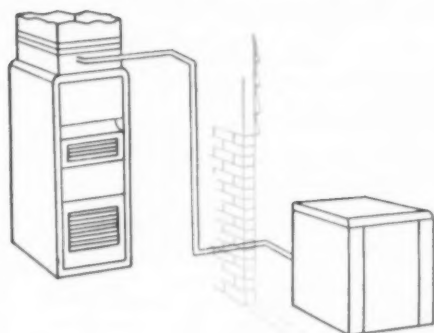
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Input capacities from 80,000 to 140,000 BTU/Hr.



**NEW OIL-FIRED COUNTERFLOW UNITS**  
Bonnet output capacities from 85,000 to 123,000 BTU/Hr.



**NEW OIL-FIRED UTILITY UNITS**  
Bonnet output capacities from 85,000 to 123,000 BTU/Hr.



## Start a Second Sale

*with every Westinghouse Furnace you install!*

Make 2 sales instead of 1! With new Westinghouse furnaces you can sell your customers heating today—add on air conditioning whenever they desire. It's simple and profitable! The same ducts that are used for heating can be used for cooling . . . the same thermostat gives them automatic year-round temperature control, too. You simply install the cooling coil in the furnace air discharge and add a Westinghouse air cooled condensing unit to the heating system. Cash in both ways: install a Westinghouse heating system now . . . use it to sell air conditioning, too!

### **Profit** with Home Heating and Cooling—PLUS!

Fast delivery, sales training, technical aid, finance plans, local advertising, sales promotion—and more. These are just some of the reasons why a Westinghouse Franchise is so highly valued by leading contractors and dealers across the nation! For complete information write:

WESTINGHOUSE AIR CONDITIONING DIVISION  
DEPT. 361, P. O. BOX 510 • STAUNTON, VIRGINIA



**YOU CAN BE SURE...IF IT'S**

# Westinghouse

AIR CONDITIONING DIVISION • STAUNTON, VIRGINIA

J-B0537A

# New... Better



## hermetic eye\*

### double port sight glass



**with revolutionary  
hermetically fused glass-to-brass  
construction... no gaskets,  
joints or fittings**

Another great stride in leakproof refrigeration installations comes with the Superior 888 *hermetic eye double port sight glass*. Here is the perfect hermetic bonding of glass-to-brass—no gaskets, joints, solder seals or fittings.

Tested to more than 3000 p.s.i., it assures leakproof operation. Double port design for clear-through vision—the word FULL clearly visible only when system is charged with refrigerant. The special heat-resistant glass possesses high tensile strength. Available in 1/4" and 3/8" male-to-male and male-to-female SAE flare.

\*Trademark

#### Simplicity of Design

- Hermetically fused glass
- All-brass body



(Patents Pending)



**LOOK FOR THE 888 HERMETIC EYE AT  
LEADING WHOLESALERS IN THE INDUSTRY**

# Superior valve and fittings co.

Pittsburgh 26, Pennsylvania



**October 7-9, 1957**

American Gas Assn. (Annual Convention)  
Kiel Auditorium  
St. Louis, Mo.

**November 14-16, 1957**

American Society of Refrigerating Engineers (Semi-Annual Meeting)  
Shoreland Hotel  
Chicago, Ill.

**November 16-18, 1957**

Air-Conditioning and Refrigeration Wholesalers (Annual Meeting)  
Sheraton Hotel  
Chicago, Ill.

**November 16-18, 1957**

Refrigeration and Air Conditioning Contractors Association (Annual Convention)  
Drake Hotel  
Chicago, Ill.

**November 18-19, 1957**

National Commercial Refrigerator Sales Association (Annual Convention)  
LaSalle Hotel  
Chicago, Ill.

**November 18-21, 1957**

10th Exposition of Air Conditioning & Refrigeration Industry  
International Amphitheater  
Chicago, Ill.

**November 18-22, 1957**

National Warm Air Heating and Air Conditioning Assn. (Committee Meetings and Annual Convention)  
Hotel Morrison  
Chicago, Ill.

**January 27-29, 1958**

American Society of Heating and Air Conditioning Engineers (Annual Meeting)  
Pittsburgh, Pa.

**May 4-7, 1958**

Air-Conditioning and Refrigeration Institute (Board Meeting and Annual Meeting)  
The Homestead  
Hot Springs, Va.

**May 5-9, 1958**

National Restaurant Association (Convention and Exposition)  
Navy Pier  
Chicago, Ill.

Now—Especially designed for  
**REFRIGERATION and AIR CONDITIONER Servicing**

# AMPROBE RS-2

Rotary-scale volt-ammeter

**150/300  
VOLTAGE RANGES\***

**NOW!** A great new rotary-range AMPROBE with all the voltage and current ranges **you** need most. Here's why AMPROBE RS-2 is 4 ways easier to read than any other test instrument you ever used.

**1. SEE ONLY ONE SCALE AT A TIME.** 4 current ranges, 2 voltage ranges—each on a scale of its own. Every range you need—all on one time-saving tester! **2. ONE HAND-OPERATION!** Range selector knob is right next to your thumb. **3. NEW MAGNIFIED DIAL...** LONGER SCALE LENGTH. Greater visibility, greater accuracy than ever before. **4. POINTER-LOCK "FREEZES"** POINTER AT READING. Use the RS-2 any place your hand can reach—Needle can be locked in place so that you may read it away from conductor.



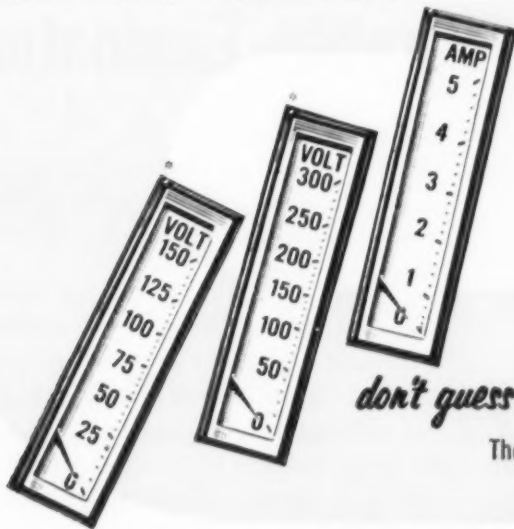
**\$39<sup>85</sup>**

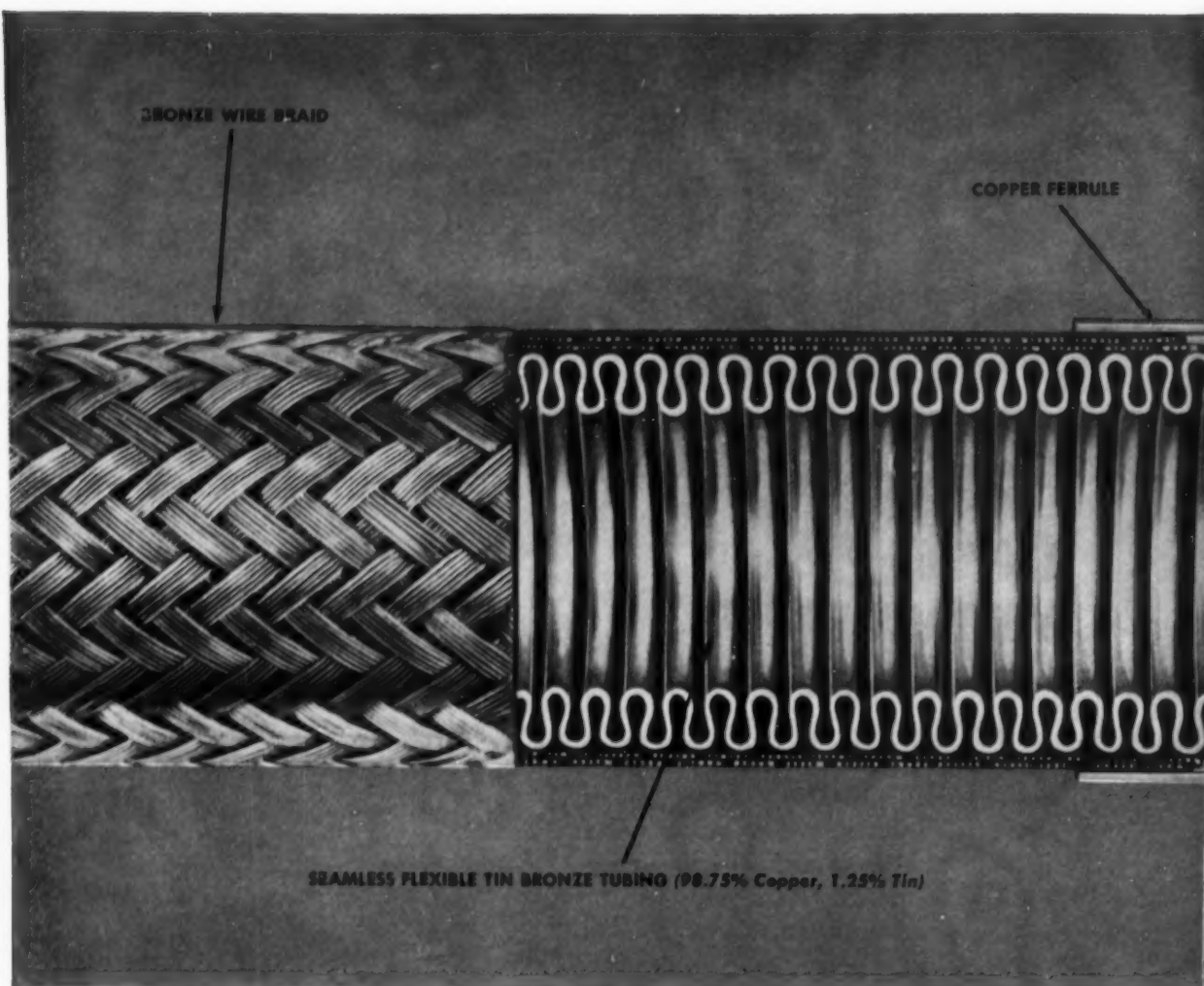
The only tester of its kind  
at the low, low price of only

*don't guess at it; **AMPROBE IT!***

There's an AMPROBE for every job and every budget

PYRAMID INSTRUMENT CORPORATION, Lynbrook, N. Y.





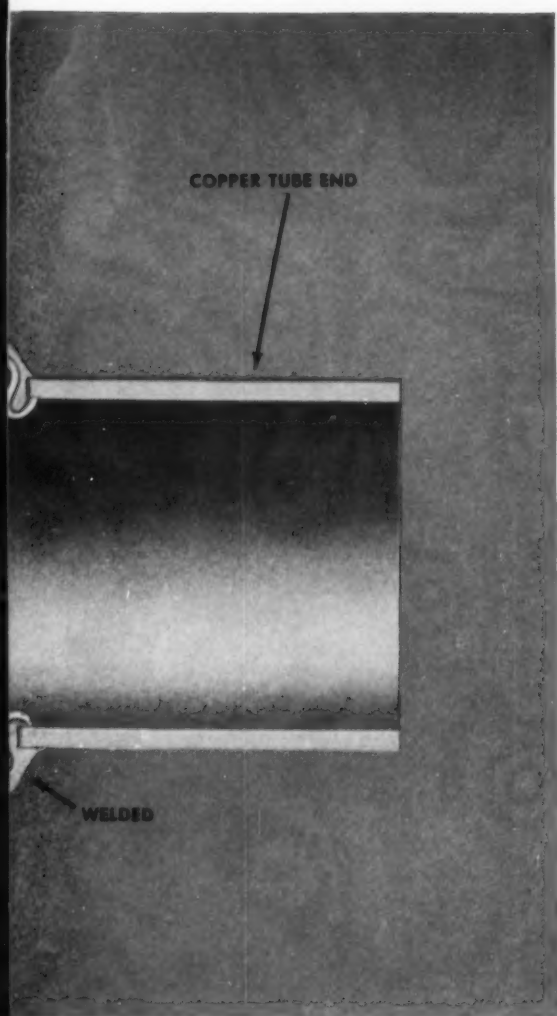
## See how the right construction gives you ...with American Vibration Eliminators

**The right metal for the job.** Core of the American VE is a seamless, flexible tubing made of a *special tin-bronze alloy* tailored specifically for the refrigeration and air conditioning industries — engineered to stand up under vibration while carrying gases and liquids under pressure. Because the core is *seamless*, there are no joints or laps where leaks can start.

**For extra strength and durability,** the flexible core is covered with bronze wire braid securely brazed in place. Double braid affords extra protection on all American VE's 2 $\frac{5}{8}$ " O.D. or larger.

**Clean, dry, tested, protected.** Before it is shipped, the final assembly is cleaned, pressure-tested, oven-dried, and sealed in a vaporproof polyethylene bag. You have a factory-fresh unit to install in the line . . . clean, inside and out!

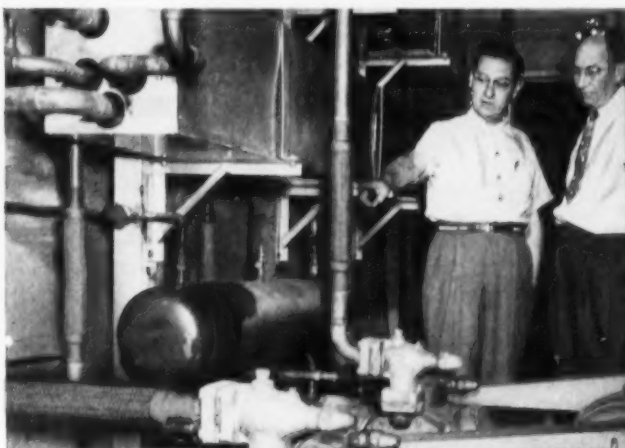
**Packaged for your convenience, protection.** Boxes containing American VE's are sturdy, easy to open, easy to identify. No confusion or fumbling. Simplified installation instructions in each box make your job easier. Insist on VE's with the stamping "American" on the ferrule . . . an Anaconda product.



## Users of American VE's say...



"AMERICAN Vibration Eliminators are insurance against costly return service calls"—Tom Stough, Co-owner, Southern Air Conditioning and Refrigeration Co., Hot Springs, Arkansas.



"17 YEARS AGO we installed our first American VE's—and they're still our choice today"—S. L. Sloan, Jr., Mechanical Air, Inc., Rochester, New York.

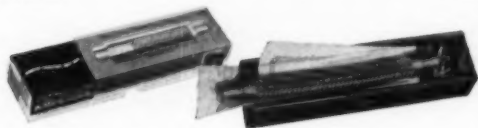


"LOW-COST business insurance . . . that's what we call American Vibration Eliminators"—United Refrigeration Service, Inc., Columbus, Ohio.

## lasting performance

AMERICAN VIBRATION ELIMINATORS—listed by Underwriters' Laboratories through sizes 3/8" O.D.—are sold by leading distributors everywhere. For descriptive folder, write: The American Brass Co., American Metal Hose Division, Waterbury 20, Conn. In Canada: The Canadian Fairbanks-Morse Co., Ltd.

47204



WHEREVER CONNECTORS MUST MOVE

# AMERICAN

For American Vibration Eliminators see your

## ANACONDA<sup>®</sup> DISTRIBUTOR

& AIR CONDITIONING • JULY, 1957

Circle No. 16 on Reader Service Card

# Double crimp

Double crimp keeps DRYSEAL tube whistle-clean, bone-dry. Crimps are tube-size, too; slip easily through fittings. Dead-soft DRYSEAL means finger-easy, no-tool bending. Try it on your next job. Sizes  $\frac{1}{8}$ " to  $\frac{3}{4}$ ".



# Revere Dryseal

COPPER REFRIGERATION TUBE

*You'll find a Revere Distributor close at hand.*

REVERE COPPER AND BRASS INCORPORATED, founded in 1801 by Paul Revere

Circle No. 17 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

# THIS COMPLETE LINE MEETS EVERY NEED FOR PUSHBUTTONS



Name your pushbutton requirement—there's a Square D unit to do the job, exactly. Three complete lines . . . standard duty, heavy duty, and oil-tight heavy duty . . . each providing a wide range of operators, stations, and circuit combinations.

*Write for Pushbutton Bulletins which give complete details. Address Square D Company, 4041 N. Richards Street, Milwaukee 12, Wisconsin.*



NOW... EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

## SQUARE D COMPANY

# How *high velocity* solves problem of *flexibility* in the Medical Towers

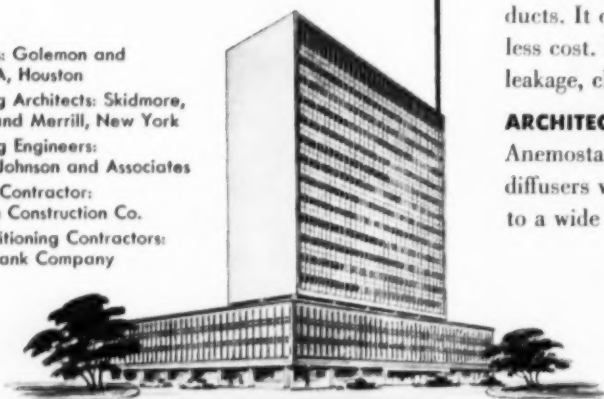
Architects: Golemon and  
Rolfe, AIA, Houston

Consulting Architects: Skidmore,  
Owings and Merrill, New York

Consulting Engineers:  
Bernard Johnson and Associates

General Contractor:  
Tellepsen Construction Co.

Air Conditioning Contractors:  
Straus-Frank Company



When the new Medical Towers Building in Houston, Texas was planned, the key air conditioning problem was flexibility. Professional office areas had to be subdivided *after* the building was completed. Here's how an Anemostat dual duct high velocity air distribution system solved the problem.

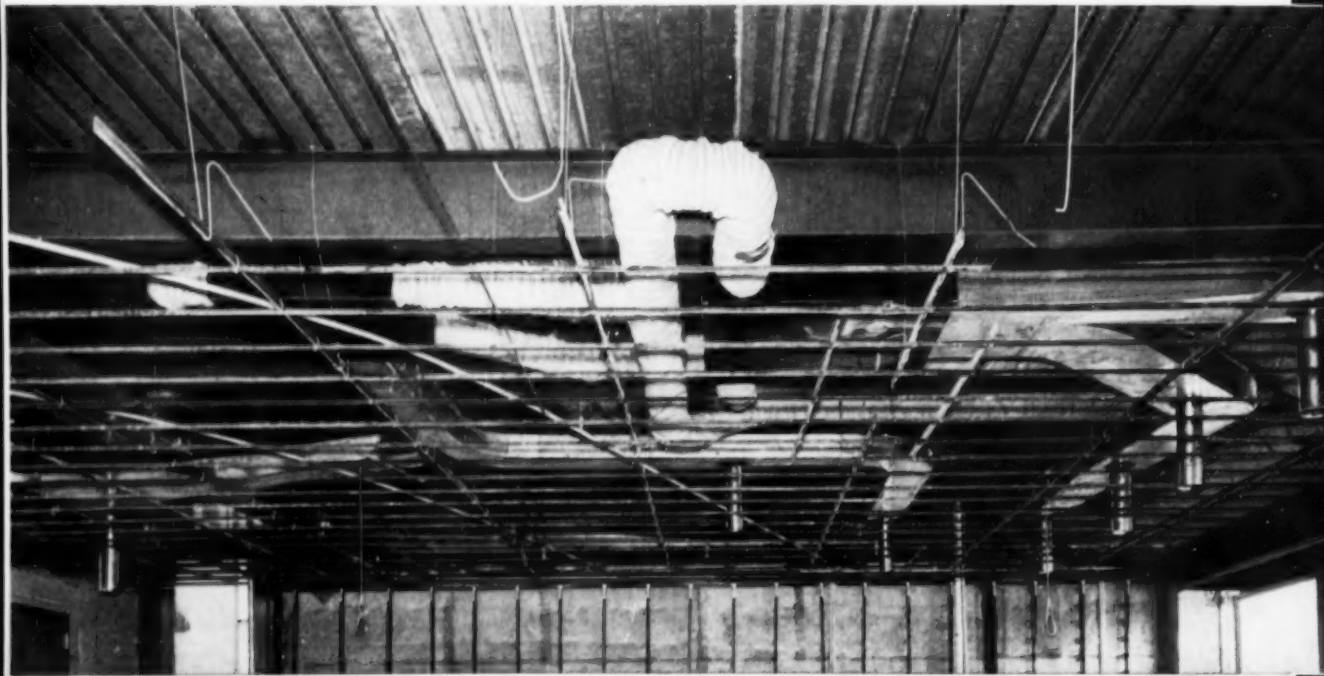
As shown in the diagrammatic sketch, a system of perimeter take-offs from the hot and cold ducts enables each doctor to provide the exact temperature he wants. Temperatures in the various rooms of each suite of offices can be varied. Air distribution is draftless, comfortable, perfectly suited to tenants' needs.

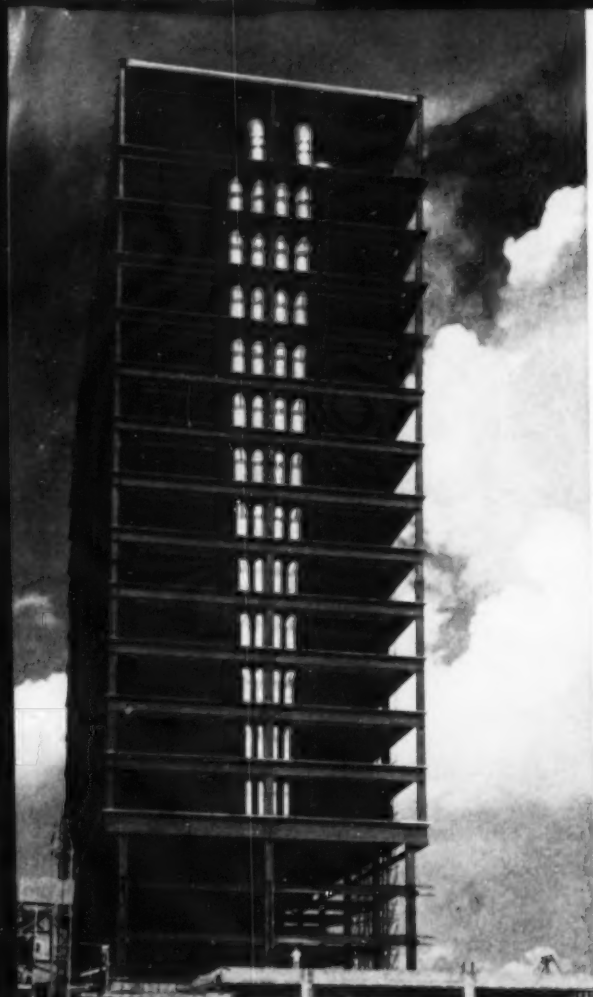
The Anemostat All-Air High Velocity distribution system offers further important advantages. It can be used with smaller than conventional ducts. It can be installed in less time and at less cost. It requires no coils, thus eliminates leakage, clogging and odors.

#### **ARCHITECTS—Attention Please:**

Anemostat round, square and straightline diffusers with high velocity units are adaptable to a wide variety of architectural designs.

Anemostat HPE units and duct connections installed in office before construction of ceiling and walls





◀ Note how locating of hot and cold ducts saves space in new Medical Towers Building, Houston, Texas



View of lobby showing Anemostat Air Diffusers



View of professional reception room

◀ Layout of typical suite



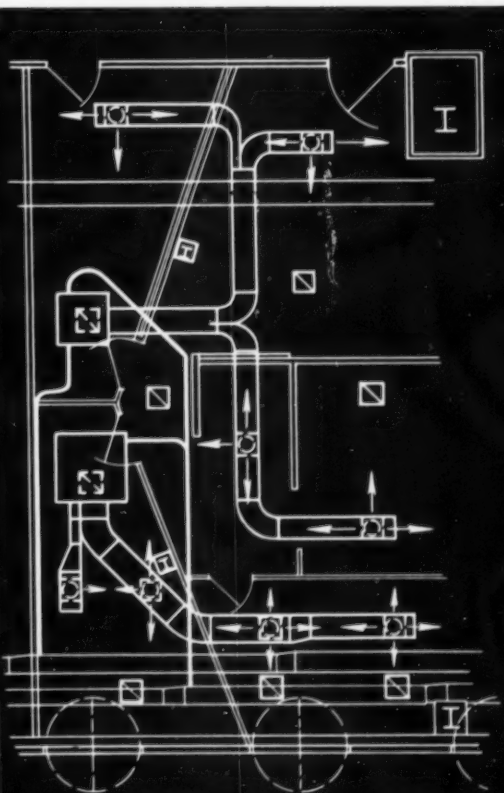
Write on your business  
letterhead for your copy of

## ***New Anemostat Selection Manual 60***

to Anemostat Corporation of America,  
10 East 39 Street, New York 16, N. Y.

**ANEMOSTAT: The pioneer of All-Air High Velocity Systems**

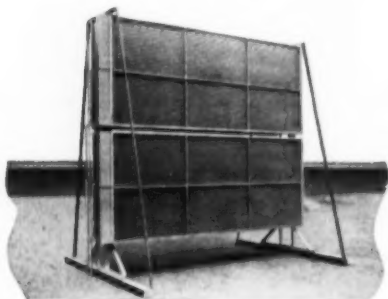
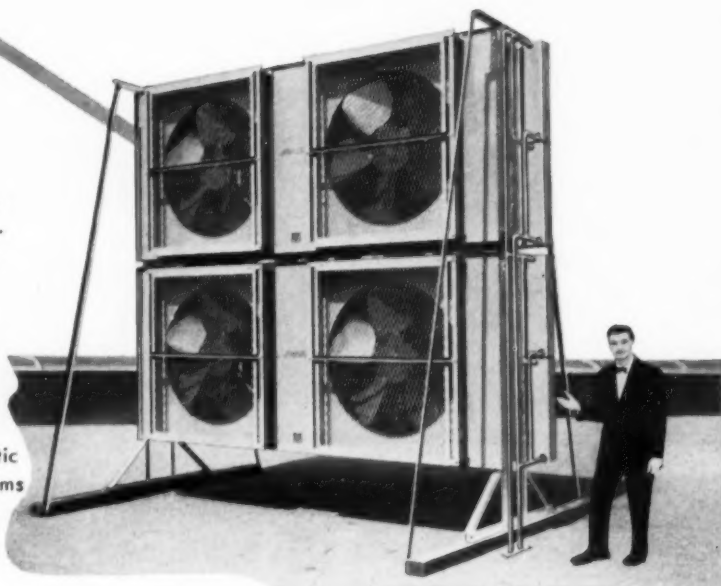
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# KRAMER UNICON

# GETS BIGGER and BIGGER

There is only one answer to large capacity condenser problems — the KRAMER UNICON. Every day more engineers plan larger tonnage installations — 50, 100 and even — 800 tons. And every day UNICONS are shipped to all parts of the world for giant-sized installations. No other air-cooled condenser can match the long, successful record of UNICON, backed by thousands of applications since 1937 — in the widest range of tonnages and climatic conditions. Your condensing problems can be best answered by use of the best — the KRAMER UNICON.



Space-saver UNICON, as illustrated, serves a 60-Ton air conditioning system, yet takes but 70 sq. ft. of roof space.

UNICON is a remote-type air-cooled condenser that requires no water. KRAMER UNICON can be used with any size compressor, REGARDLESS of horsepower. Any size refrigeration or air conditioning system can be air-cooled with UNICON, REGARDLESS of tonnage. UNICON requires less horsepower, less piping, is easier to install and costs less. KRAMER UNICON performs best — even in semi-tropical climates.

WRITE FOR BULLETIN U-210D

## KRAMER TRENTON CO. • Trenton 5, N.J.

**They'll want to finance it,  
so call in **COMMERCIAL CREDIT****



**MAKE YOUR PROPOSALS COMPLETE**

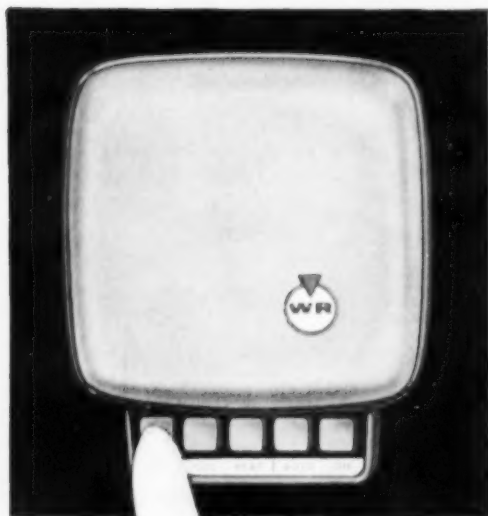
... most of your prospects need their cash and usual lines of credit for current operations ... make it easier for the prospect to sign on the dotted line by including financing arrangements. **COMMERCIAL CREDIT's** Refrigeration Plan is backed by many years' experience, handling financing for thousands of commercial refrigeration and air conditioning installations. Let us show you how **COMMERCIAL CREDIT's** method functions smoothly ... saves you time and trouble. Over 300 offices assure fast service. Call our office in your city or write **COMMERCIAL CREDIT CORPORATION**, Commercial Credit Building, Baltimore 2, Maryland.

**COMMERCIAL CREDIT CORPORATION** • A service offered through subsidiaries of Commercial Credit Company, Baltimore ... Capital and Surplus over \$200,000,000 ... offices in principal cities of the United States and Canada.

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Straight out of TOMORROW  
for your profit TODAY

...two *Fashion* -Styled Controls  
by WHITE-RODGERS



the fabulous new

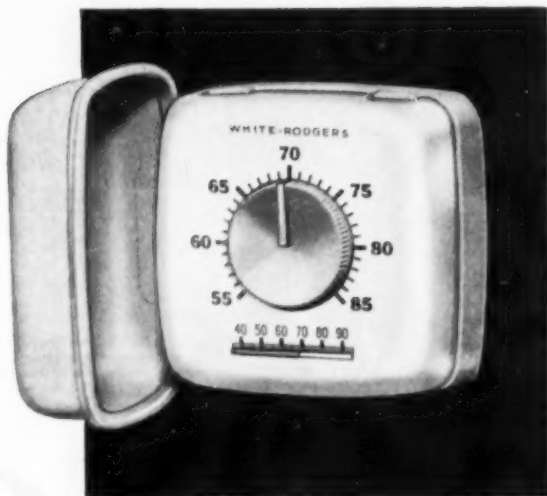
*Fashion* **PUSHBUTTON**  
heating-cooling thermostat

PushButton, year-'round temperature control is now combined with the powerful, sales-motivating styling of the Fashion. Sub-bases to fit any heating-cooling system... backed by the name that's famous for quality controls... White-Rodgers!

the incomparable

*Fashion* **THERMOSTAT**

Styled to sell with the right shape  
... the right color... smart hinged cover,  
can be painted to match the wall, no  
dials peek through. Ideal for replacement  
of outmoded thermostats... Inconspicuous  
baseplate covers any spots left by  
old-style controls.



Both thermostats are equipped with latest design dial-type adjustable resistor... can be set to match any primary control

For full, profit-making details... contact your local White-Rodgers office — or write, wire or phone us today!



TEMPERATURE CONTROLS for MODERN COMFORT

**WHITE-RODGERS**

ST. LOUIS 9, MISSOURI

TORONTO 8, CANADA

Circle No. 22 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

# Crystal Tips—best ice made

EVERY *Crystal Tips* ICE MAKER  
 MAKES TWO KINDS OF ICE AUTOMATICALLY  
 PURE, REFRESHING SOLID CUBES OR CHIPS!

For better tasting, more refreshing drinks and perfect ice for *all* needs, Crystal Tips ice is best. Prove this to yourself by personally examining the actual ice produced by a Crystal 2-in-1 Ice Maker.

**Increase Your Sales Volume, Sell 2-in-1 Ice Convenience**—Crystal Tips 2-in-1 Ice Makers mean *extra* sales because you offer *complete* ice service for any ice user. You'll sell more ice makers when you offer the Crystal Tips line and you'll sell them faster, *easier*.



It pays to be a Crystal Tips dealer or distributor. Contact us now for full details about Crystal Tips money-making opportunities.

## AMERICAN

AUTOMATIC ICE MACHINE CO.

1777 Fourth Street N.W. • Faribault, Minnesota

A Subsidiary of McQuay, Inc.

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IN CANADA: FRONTIER COMMERCIAL REFRIGERATION, LTD. • 1470 The Queensway, Toronto 4, Ontario

& AIR CONDITIONING • JULY, 1957

Circle No. 23 on Reader Service Card

25



Jenni Genetron says:



For refrigerants that are Super-Dry

Always be sure to specify...

**genetron**<sup>®</sup>

SUPER-DRY REFRIGERANTS

Tops in quality...

Tops in performance

Available from wholesalers everywhere.

|                      |              |                           |
|----------------------|--------------|---------------------------|
| <b>genetron 12</b>   | WHITE LABEL  | DICHLORODIFLUOROMETHANE   |
| <b>genetron 22</b>   | GREEN LABEL  | MONOCHLORODIFLUOROMETHANE |
| <b>genetron 11</b>   | ORANGE LABEL | TRICHLOROMONOFUOROMETHANE |
| <b>genetron 113</b>  | PURPLE LABEL | TRICHLOROTRIFLUOROETHANE  |
| <b>genetron 114A</b> | BLUE LABEL   | DICHLOROTETRAFLUOROETHANE |



*See Your Wholesaler*

**GENERAL CHEMICAL DIVISION**

ALLIED CHEMICAL & DYE CORPORATION  
40 Rector Street, New York 6, N. Y.



## ABOUT PEOPLE

Dunham-Bush, Inc. has announced the election of **A. G. Zumbrun, Sr.** as vice president and director; **G. C. Mumford** as assistant treasurer; and **S. W. Mozley** as a member of the board of



A. G. Zumbrun G. C. Mumford

directors. Zumbrun and Mumford will serve as the top management group of the Brunner Div., Utica, N. Y., recently acquired by Dunham-Bush as a wholly owned subsidiary. Zumbrun has been with Brunner since 1925, and president since 1950. Mumford joined Brunner in 1953, and was elected to the board of directors in January 1957. Mozley, with Fusz-Schmelzle & Co., Inc., St. Louis, had been a director of Brunner.

**Donald R. Vick** has been appointed manager of the branch office opened recently by Century Electric Co. in Portland, Ore. The new office is located at 1238 N. W. Glisan St. Vick joined Century in March, 1957 after extensive experience in the electrical industry.

The appointment of **George R. Lawson** as director of marketing of Pennsalt Chemicals' Industrial Div. has been announced. In this newly created position, Lawson will direct the combined sales organizations of the former Sharples

and Industrial Chemicals Div.'s which have been consolidated in the formation of the company's Industrial Div.

Following the retirement of **John M. Bickel**, vice president of Carrier Corp. and general sales manager of its Unitary Equipment Div., **George T. Long** has been named director of marketing for the division, and **William A. Lake** has been named sales manager. Long will be in charge of headquarters activities such as application engineering, technical and distributor services, sales



W. A. Lake G. T. Long

training, business consulting and order departments. Long will be responsible for the divisional field sales staff and the distributor-dealer organization. Long has been with Carrier since 1929, Lake since 1951.

**J. F. Scott** has been elected vice president of the Perolin Co., Inc., New York City, manufacturer of water treatment chemicals for refrigeration and air conditioning systems. Scott previously was associated with American Oil Co. as assistant to the vice president and general manager of Pan American Chemicals Corp., its petrochemicals subsidiary.



**G. C. Workinger** has been named general sales manager of



McQuay, Inc., Minneapolis. He comes to McQuay after 20 years with York Corp., where for the past 17 years he has been manager of procurement.

Prior to that time he served in the engineering standards department and as an application engineer. **Kenneth R. Lundberg**, who has been serving as acting sales manager, has resumed his position as general manager of the McQuay plant at Grenada, Miss.

**George D. Wookey**, Inglewood, Calif., has been appointed regional sales manager for Mueller Climatrol in California, Arizona and Nevada.

**Richard C. Niess** has been named manager of refrigeration sales for the Industrial Div. of York Corp., subsidiary of Borg-Warner. Niess joined York in 1944 and has been an application engineer, sales engineer, supervisor of air conditioning products and assistant manager of air conditioning sales.



**Stanley Clobridge** has joined Ansul Chemical Co. as a refrigeration sales representative. Working out of the company's Houston office, he will cover southern Texas, Mississippi and Louisiana. Clobridge formerly was a divisional manager for



**Here it is!** one of the new Mueller Brass Co.  
refrigeration products that are  
**out of this world!**

the new

*Safety-master*

**PRESSURE RELIEF VALVE**

**safety engineered for high volume discharge**



New Mueller Brass Co. pressure relief valves provide positive action and high volume discharge. Safety-Masters are built to meet the A.S.A.B. 9 safety code, comply with A.S.M.E. code, and are certified by the National Board. Safety-Masters are available in pressure settings from 150 lbs. to 450 lbs. Settings are factory-accurate and are stamped on the body of the valve. All valves are safety sealed to guarantee maintenance of setting accuracy. In operation, the unique instant action of the valve seat disc relieves pressure without chatter or vibration, and provides complete and positive reseating. Safety-Masters are available in 12 different end connections in straight-through or angle type, and are all made from premium quality brass for superior strength. Every Mueller Brass Co. pressure relief valve is packed in strong metal edge cartons for complete protection until installation. Be sure to specify Safety-Master . . . another new Mueller Brass Co. product that is "out of this world" in design, engineering, and performance.

**WRITE TODAY for  
new product data  
sheet No. 11**



**MUELLER BRASS CO.** PORT HURON 14, MICHIGAN

Circle No. 25 on Reader Service Card

C. V. Hill & Co., and earlier was with Hussmann Refrigeration as a district manager.

**Marshall F. Robbins** and **L. C. McInteer** have been appointed regional sales managers, residential division of York-Shipley, Inc. Robbins will cover New England and New York state, and will headquarter at Brockton, Mass. McInteer, in builder sales, has been appointed Middle Atlantic



L. C. McInteer

M. F. Robbins

regional manager, with headquarters in York. He formerly was vice president and sales manager for Sterling Air Conditioning Co.,

Gastonia, N. C. Previously, he was North Carolina sales representative of American Furnace Co., St. Louis, and was with Coleman Co., Wichita, as Rocky Mountain sales supervisor.

**William H. Smith** has joined Perfection Industries Div. of Hupp Corp. as assistant to the heating and cooling sales manager. He was formerly Chicago district manager of Acme Industries.

Two executive promotions at Carrier Corp. have been announced. **George Lilygren**, vice president and general manager of the Machinery and Systems Div., has been placed in charge of the



G. Lilygren

C. V. Fenn

newly formed Corporate Development Div. Lilygren will be responsible for the integration and acquisition program. **Charles V. Fenn**, vice president and assistant general manager of the Machinery and Systems Div., has been named general manager to succeed Lilygren. Lilygren joined the firm in 1947 as comptroller. He was elected a vice president of Carrier the following year. Fenn has spent his entire business career with Carrier.

**Daniel F. Pillow** has been named manager of the newly established service department of the Kold-Hold Div., Tranter Mfg., Inc. He will be in charge of all activities of the department including establishment of service procedures and expansion.

**New, Exclusive**  
**Wimco**  
**Flaring Tool**

**Makes Short Work of any Job!**

945 F Cadmium Plated . . . . . \$11.65  
945 FD Polished Chrome Finish \$13.65

## 9 Popular Size Flares All in One Tool!

1/8" — 3/16" — 1/4" — 5/16"  
3/8" — 7/16" — 1/2" — 5/8" — 3/4"

CONE—Tool Chrome . . . Positive Centering

### EXCLUSIVE Wimco FEATURES

- Automatic gage.
- Special clamping dies with patented shape for clamping all 9 sizes of tubing.
- Patented relief at base of all chamfers.

Wimco sets a new standard in flaring tools . . . does every job with speed, precision and perfect ease of operation! Flares all 9 sizes of soft tubing quickly and easily.

Lightweight, compact and foolproof. Precision-engineered for absolute accuracy. Save time, save money with the Wimco flaring tool — performance-proved to do any job perfectly!



**New Patented Relief** at bottom of chamfers assures perfect radius and stronger flares than possible with other tools!



**Automatic Gage** swings into position automatically when tool is opened (out of the way when clamped) — controls tube insertion height. Positive assurance of precision flares.

■ If your supplier doesn't have Wimco tools, write for information on the complete line.

**WILSON**  
**MANUFACTURING CO.**  
787 South Barksdale St.  
Memphis 4, Tennessee

sion of the division's educational program for Kold-Hold distributors. Pillow joined Tranter five years ago as a sales engineer.

**Newton Anderson** has resigned as president of Anderson Chemical Co., Macon, Ga., and formed a new company known as Newton Anderson & Co. The new firm, also located in Macon, will manufacture a complete line of water-treating chemicals for industry, including scale and rust removers and inhibitors for boilers and air conditioning and refrigeration systems.

**M. A. Stinnette**, former chief chemist for Anderson Chemical Co., and his assistant, **John Mancin**, will head up the new company's modern laboratories which offer a complete water analysis service to industry.

**John D. B. Gould** of Paoli, Pa. has been appointed the sales staff of Pennsalt Chemicals Corp.'s new line of Isotron refrigerants. He will serve the refrigeration and air conditioning manufacturers in the middle west with headquarters in Chicago.

Appointment of **Clarence C. Smith** as director of engineering of Tranter Mfg., Inc., has been announced by James R. Tranter, president. Smith formerly was a design and project engineer for Flint and Walling Mfg. Co., Inc., Kendallville, Ind., and Duriron Co., Dayton, Ohio.

Appointments of two new sales engineers for its Chicago regional office has been announced by W. R.



I. E. Corwin V. Landman  
Eichelberger, vice president-director

of sales, Acme Industries, Inc. **Irvon E. Corwin** has a wide background of experience in the sales and servicing of all types of air conditioning and refrigeration equipment. **Valdi Landman** has spent the last 10 years handling domestic and export sales for retail organizations, engineering firms, and for air conditioning and refrigeration manufacturers.

**Joseph H. Spitzley** is the new president of the Mechanical Con-

**WATER  
MUST BE  
KEPT  
OUT!**



If water penetrates the diver's suit, he is in a "bad spot". Tight equipment and painstaking care before putting the suit into use is a "must" . . . a preventive of disaster from water.

Similarly, an excellent method of preventing water troubles in new and reconditioned refrigeration systems is to inject a small amount of Thawzone, the moving dehydrator . . . ready to destroy moisture wherever it shows up in the system.

#### OTHER ADVANTAGES OF THE THAWZONE METHOD:

1. Actually destroys moisture . . . not a mere anti-freeze.
2. Scavenges oxygen . . . helps to overcome the harmful effect of traces of oxygen which may remain in a refrigeration system after the usual purging.
3. Cannot cause pressure drop.
4. Does not release moisture when temperature changes.
5. May be used in open or hermetic units containing any of the "Freons", methyl chloride, methylene chloride or isobutane.
6. Costs only about 8 cents per lb. of refrigerant treated. Used in minute amounts.

Why don't you try a 1 oz. bottle of Thawzone?

Also available in 4 oz. and pint bottles.

Call your wholesaler.

**Highside Chemicals, Incorporated**

(Formerly Stewart Industries, Inc.)  
4 Colfax Avenue, Clifton, N. J.



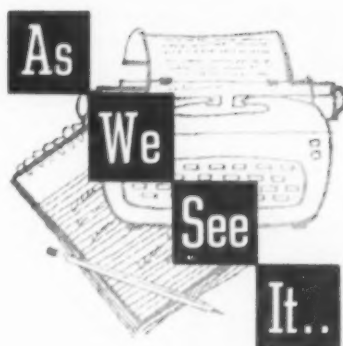
tractors Association of America. Spitzley, president of R. L. Spitzley Heating Co., Detroit, was elected to the office at the association's annual convention at Miami.

E. J. Friese has been named factory representative for Utility Appliance Corp., Los Angeles, in all of Texas except the El Paso marketing area. His headquarters are in Dallas. John L. Hall has been appointed manager of sales for southern California.

E. R. Boynton has been appointed assistant chief engineer of Tecumseh Products Co., effective May 20. He formerly was with General Electric Co. and Copeland Refrigeration Corp.

George E. Reade is a new wholesaler sales representative for Wolverine Tube in the Chicago area. He will headquarter in Wolverine's Evanston, Ill. offices.

Continued on page 76



**Every person** who has, or hopes to have, anything to do with selling residential air conditioning should make "must" reading of the article on "Comfort Engineering" in this issue.

One of the points the author, Tyler S. Rogers, makes will bear repeating here. Crediting the remarkable growth of automobile air conditioning to the "high salesmanship" of the automotive industry, he says:

"Surely all of us in the heating and air conditioning industry can do as well. We can sell better. We can upgrade our products and increase their use. We can offer better performance, better comfort, better 'mileage per gallon' or lower operating costs by working together.

"We can do lots of things once we stop cutting down on quality to get a competitive price, and start improving performance to earn a higher price.

"Market-wise, we have as much potential growth ahead of us as the automobile industry had when the Model A Ford displaced its predecessor."

**Right now**, our problem is how we can best realize that potential growth. This year, or last, the weather hasn't been in our corner. Selling has been tougher, and as a result more dealers than we like to think about have stopped selling the benefits of air conditioning — what it will do for the user — and concentrated on price.

Which, of course, isn't selling at all. As was pointed out in the article in our May issue, "Air Conditioning Men are Lousy Sales-

*In the Dairy Industry, too—*

**TO PROVIDE INSTANT CONNECTION AND  
DISCONNECTION OF TRUCK REFRIGERANT LINES**

**HANSEN**

**QUICK CONNECTIVE  
SERIES H K**

**TWO-WAY SHUT-OFF  
COUPLINGS**

Both ends close off line  
AUTOMATICALLY—  
INSTANTANEOUSLY

Typical refrigerant line installation for servicing plate refrigerated work fleet from central refrigerating unit.

**Hansen Two-Way Shut-Off Couplings**  
provide instant connection or dis-  
connection of truck refrigerant lines.

● On almost a countless variety of applications, Hansen Series HK Couplings provide instant connection and disconnection of fluid lines, eliminate costly delays—save time, effort and money.

To connect, you merely pull back sleeve and push Plug into the Socket. To disconnect, just pull back sleeve. This disconnects Coupling—automatically seals both ends of line with practically no spilling of liquid or escape of gas. Hansen Series HK Two-Way Shut-Off Couplings are available with female pipe thread connections from 1/4" to 1" inclusive. Available in brass or steel.

Also Straight-Through and One-Way  
Shut-Off Couplings. Write for Catalog.  
REPRESENTATIVES IN PRINCIPAL CITIES

SINCE 1915

**THE HANSEN**

4031 WEST 150th STREET • CLEVELAND 11, OHIO

**QUICK-CONNECTIVE FLUID LINE COUPLINGS**

**MANUFACTURING COMPANY**

Circle No. 28 on Reader Service Card

men," price in itself is the least important of the buying decisions the customer must make. If you've qualified him as a legitimate prospect, price is only a dodge he uses to keep from giving you his real reason for not buying.

It ought to be your cue to review your sales story to him, to see where you've missed the boat.

\* \* \*

*It could be* that you haven't convinced him that the product you're selling has "plus benefits" that the other brands he's considering don't have.

It could be that you haven't convinced him that the product you're selling will give him better, more satisfactory service than all the others; and that, if minor adjustments are needed, you can top the field in taking care of them quickly and economically.

It could be that you haven't sold yourself to him as the source from which he should buy.

Nine chances out of ten, you haven't made the prospect *want* your product enough. The holes in your sales approach have left him a loophole, and he's using "price" as an out.

\* \* \*

*Your job* is to show him that there's a whale of a difference between *price* and *value*.

Biggest mistake the dealer can make is to mention price himself. The principle of this is as old as selling. You've handed the prospect a limb to hang all of his real objections on. You've only succeeded in making the road to the sale a rougher one for you.

Sell the benefits of air condition; make the customer want it because of what it will do for him. Be a creative salesman. Prove that your product is better — that it's worth every cent the customer pays for it, and more.

Then you'll push dat ole debbil *price* down where it belongs; at the very bottom of the pile. And when the prospect brings it up — if he dares to — you've already established that it's the least of his considerations.

If every dealer in the business did this, it wouldn't be too many.

## DUBE WINS "AMERICAN SUCCESS STORY" AWARD

John Dube, president of Alco Valve Co., was one of 10 persons cited for "American Success Story" awards by the Free Enterprise Awards Association, New York City, for symbolizing the success possible under our free enterprise system.

Dube, a native of Austria, rose through the ranks from engineer to president of Alco Valve, and sales of the company's products have increased 16-fold under his

leadership. He holds 30 patents in various fields.

## PENNSALT CHEMICALS IS COMPANY'S NEW NAME

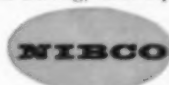
Pennsalt Chemicals Corp. is the new name by which the former Pennsylvania Salt Mfg. Co. will be known from now on. Directors and stockholders approved the name change at the recent annual meeting. The company produces "Iso-tron" refrigerants and a wide range of chemicals and chemical products.



### NIBCO "ONE SPOT" PURE COPPER WROT FITTINGS\*

Precision-sized for quick fit to tube, NIBCO wrot fittings in popular sizes are also designed for soldering with "one spot" heating as shown above. The smooth interiors of these wrot fittings assure rapid flow... their compact metal grain structure is as strong, and equally resistant

to gas leakage as the tube itself. What's more, rigid factory inspection and careful packaging mean NIBCO wrot fittings pass all tests when the installation is completed. To be right, buy right... specify "NIBCO" on your next order for wrot copper fittings. There is no "or equal!"



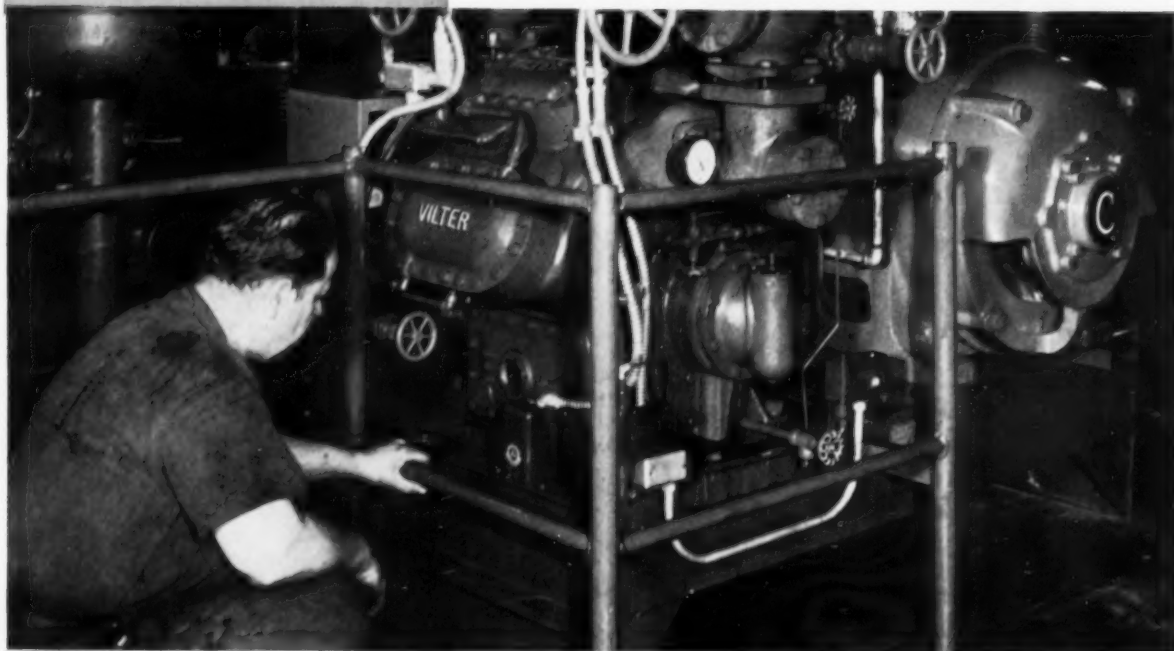
Write for free catalog

NIBCO Inc., 714 Plum Street  
Elkhart, Indiana

\*Designed to equal or exceed American Standards Association specification No. B16.22-1951

Circle No. 29 on Reader Service Card

## Get the power you need for smooth, swift compressor operation with



100 HP Century Performance-Rated type SCH Motor drives 4-stage compressor in air conditioning installation at large hotel.



**Performance-Rated<sup>®</sup>  
MOTORS**

Century has the motors you need... Performance-Rated to your specific applications! Here, a Century motor smoothly delivers the power for efficient compressor operation... with swift and easy acceleration from rest to full speed. Quiet starting and running characteristics; and where starting current must be limited, they are connectible for part winding starting. Available up to 400 HP.

You can get Century Performance-Rated Motors to fit the precise requirements of your installations: for compressors, circulating pumps, cooling towers, fans, blowers, stokers, etc. Sleeve or ball bearing; wide range of torque, speed, mountings, frames. Call or write your nearby Century District Sales Office or Authorized Distributor.

**Performance-Rated<sup>®</sup>  
MOTORS**  
1/20 to 400 H.P.



**CENTURY ELECTRIC COMPANY**

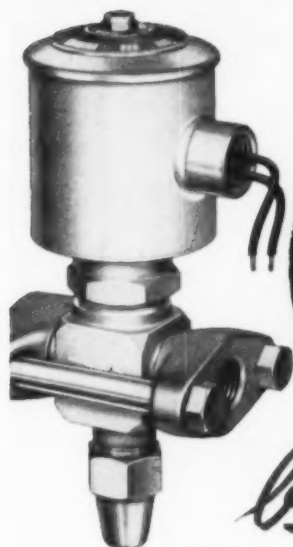
1806 Pine Street • St. Louis 3, Missouri • Offices and Stock Points in Principal Cities

Circle No. 30 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

# buy SPORLAN

## PEAK PERFORMANCE SOLENOID VALVES



*with the*  
**POWER  
PACKED  
BLUE SEAL COIL!**

*because*

... it is layer wound with a cross woven insulating layer of cotton thread between each layer of magnet wire, thereby minimizing coil burn out.

**After Winding** ... it is twice dipped in high temperature insulating and moisture repellent varnish and baked after each coating. Its final Blue Seal protective coat and bake assures a perfect moisture proof seal.

**Plus all these additional SPORLAN engineering features...**

Simplicity... few parts... sturdy take apart construction... floating type stem and plunger assembly... tight closing... internal parts precision machined. All large capacity pilot piston operated solenoid valves are equally applicable to Refrigerants 12, 22, and Carrene-7. Synthetic seating originally introduced by SPORLAN in 1947 has now been incorporated in the design of all pilot piston solenoid valves and in some direct connected models. 3 size Blue Seal Coils fit the complete line of SPORLAN Solenoid Valves thereby affording greater interchangeability of coils. Large capacity sweat type connection valves are assembled hand tight... saves valuable time in removing internal parts before installing valves in the system. A universal mounting bracket fits all valves.

**and Remember...** for Peak Performance on all installations

Buy SPORLAN Right Down the Line... Catch-Alls... Solenoid Valves...  
Thermostatic Expansion Valves... and Refrigerant Distributors.

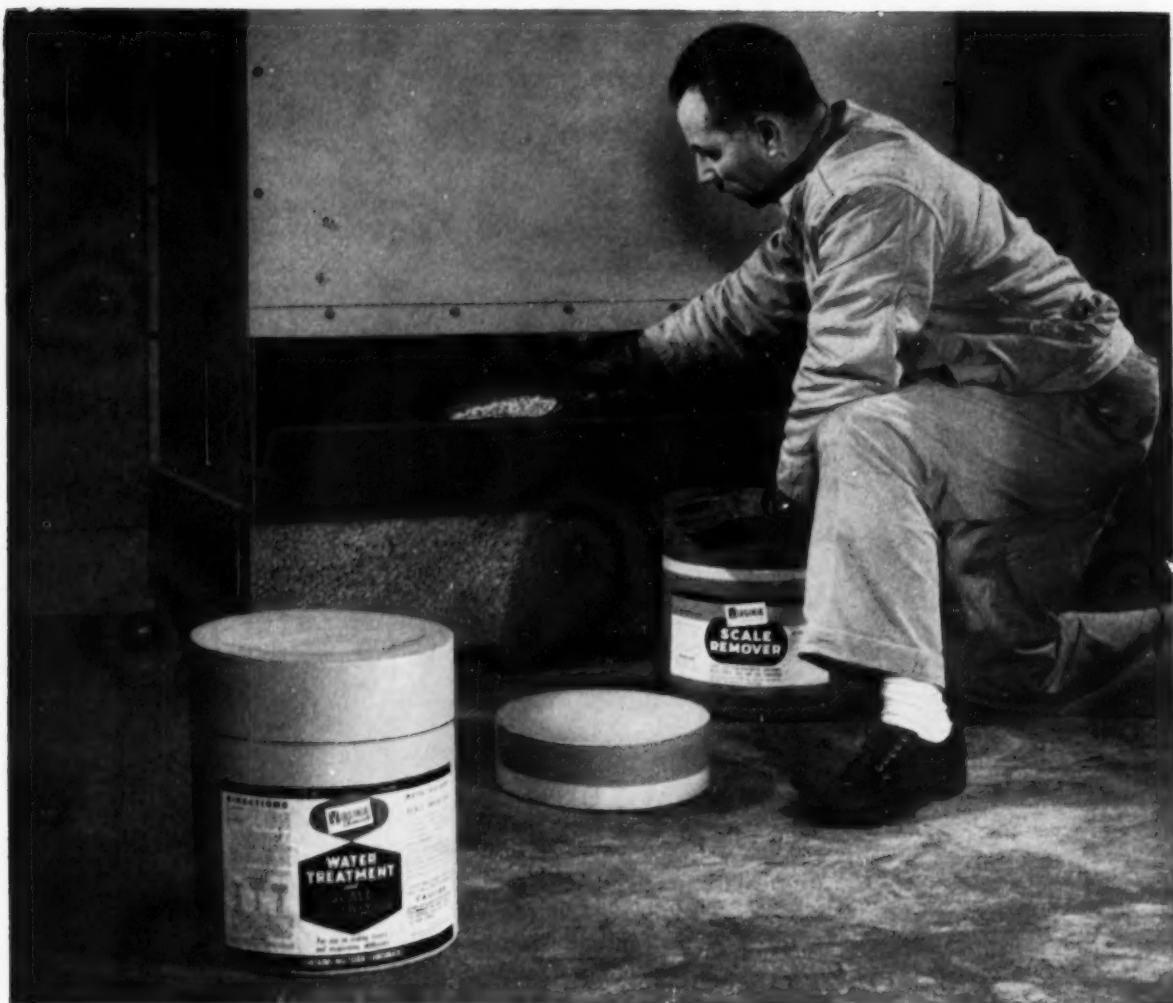
### SPORLAN VALVE COMPANY



7525 SUSSEX AVENUE ST. LOUIS 17, MO.

EXPORT DEPT. AD. AURIEMA, 85 BROAD ST., NEW YORK 4, NEW YORK

Circle No. 31 on Reader Service Card



"Virginia" Water Treatment Chemicals help keep air conditioning and refrigeration installations operating at peak efficiency

## "We found ourselves faced with increasing problems of scaling of condensers"

The increased use of water saving devices is creating a scaling problem for equipment servicing firms all over the country. The complaint above came to us in a letter from Archie L. Robertson, Service Manager of the Allied Equipment Co., Minneapolis, Minn.

Mr. Robertson then goes on to say that after using "many brands of chemicals and compounds for cleaning these systems without getting results,"

he began using "Virginia" Scale Remover and was delighted with the performance. "We congratulate you on a very fine product."

Like many other equipment service managers, Mr. Robertson found that once old scale was removed, "Virginia" Scale Inhibitor prevented formation of new scale. You, too, will be pleased with the way "Virginia" Scale Remover and Scale Inhibitor restore and maintain

maximum heat transfer for peak operating efficiency.



Ask your supplier about "Virginia's" other Water Treatment Chemicals: "Virginia" Algae-Cides No. 1 and No. 2, and "Virginia" Ice Machine Cleaner. Or write Refrigeration Division, VIRGINIA SMELTING CO., 277 Jefferson St., West Norfolk, Va.

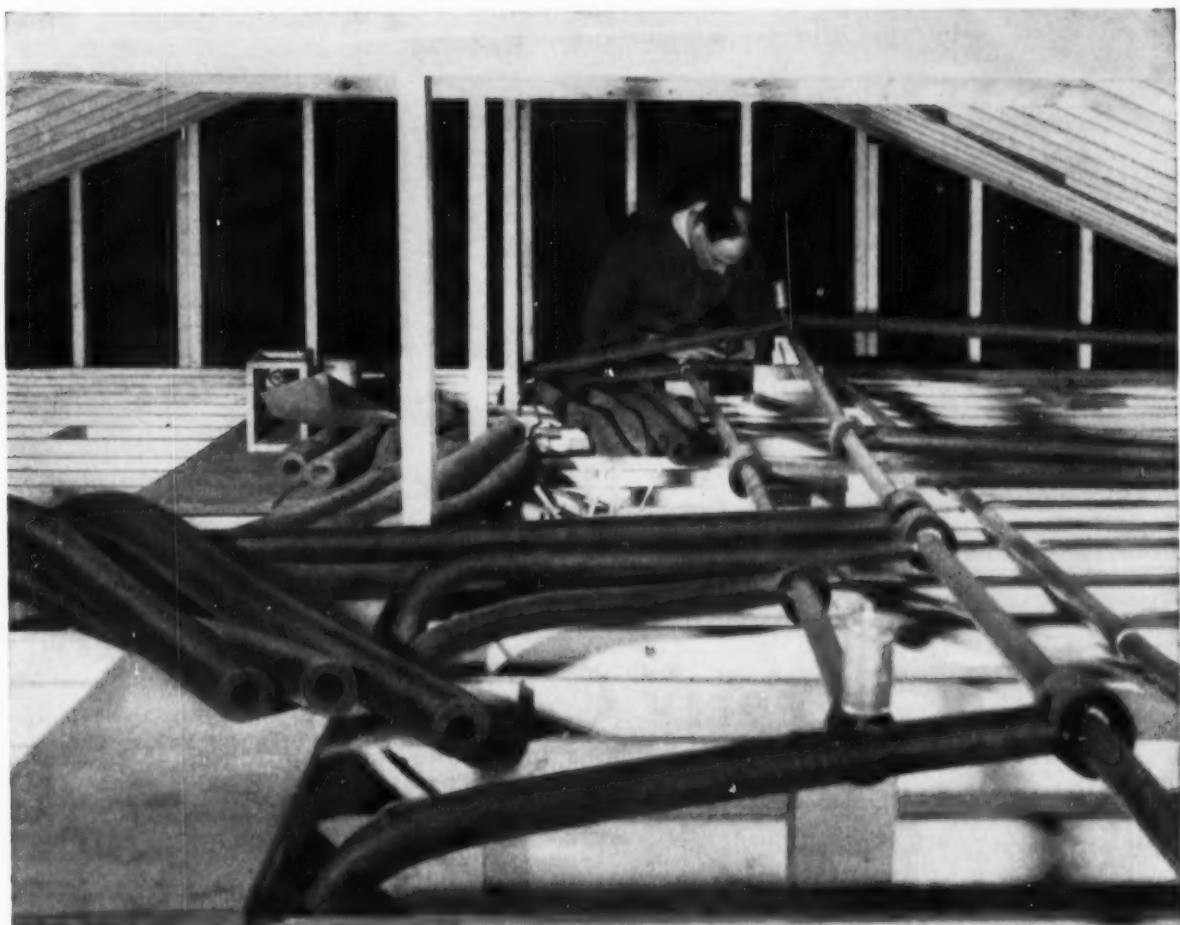


ESOTO-KINETIC CHEMICAL'S "FREON" REFRIGERANTS • V-METH-CAN-O-GAS • PERMAGUM • PRESSTITE TAPE • KWIKWRAP  
SUNISO REFRIGERATION OILS • WATER TREATMENT CHEMICALS

Available in Canada and many other countries

Circle No. 36 on Reader Service Card

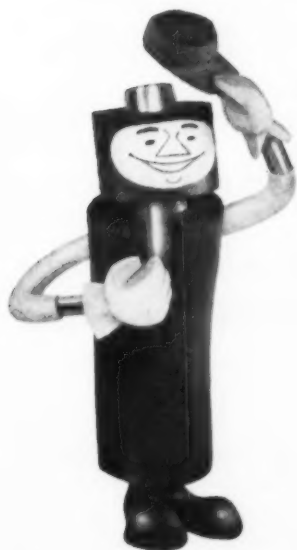
JULY, 1957 • COMMERCIAL REFRIGERATION



When liquid cooling-heating lines run in attic spaces, insulate them with Armaflex to protect the ceiling from condensation damage, and to prevent heat loss, too.

ANDY ARMAFLEX says:

## **"You can stop harmful condensation with this new pipe insulation"**



Now you can install liquid cooling-heating systems without fear of trouble from condensation. Just apply Armstrong Armaflex®, then walk away from the job and forget it. Armaflex is a remarkable new pipe insulation. Its closed cell structure is a positive vapor barrier, seals out air and moisture on cooling lines. On the heating cycle, Armaflex withstands 200° F.

You'll find Armaflex is especially fast and easy to install, too. It's a highly flexible material that slips right over pipes and copper tubing before connections are made.

If lines are already in operation, just slit Armaflex lengthwise, snap in place, and seal with Armstrong 520 Adhesive. Fittings are easily insulated with miter-cut pieces cemented together. Armstrong Armaflex comes in 6' lengths, for pipes and tubing up to 3½" o.d.

A free booklet gives full details. For your copy, write Armstrong Cork Company, 2107 Rumford Avenue, Lancaster, Pennsylvania.

# **Armstrong INSULATIONS**

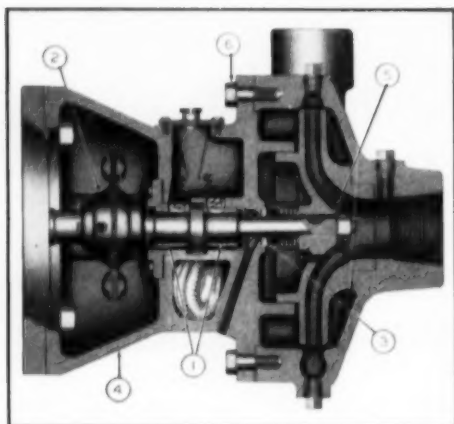
Circle No. 33 on Reader Service Card

**B & G**  
**SERIES 1522**  
 CENTRIFUGAL PUMPS



## REALLY Quiet!

...your answer to noise problems in cooling tower installations



In the B&G Series 1522 Pump, noise has been engineered out... together with usual causes of unsatisfactory performance.

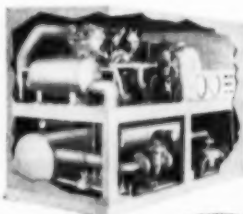
The cut-away illustration at left tells the story—

1. Long bronze sleeve bearings in both the pump and motor assure quiet operation.
2. Spring-type flexible coupling makes a noise-dampening connection between pump and motor.
3. "Remite" Mechanical Seal positively ends leakage. Harder than glass—wearproof—self-lubricating.
4. Bearing bracket sub-assembly, including shaft and sleeve bearing, is easily removed and is interchangeable in all B&G 1522 Pumps.
5. Dynamic balancing of the impeller prevents shaft vibration and seal failure. Balancing chamber and relief holes eliminate thrust load on pump bearings.
6. Easily serviced. Removal of a few bolts permits separation into three parts.

B&G Series 1522 Pumps are available as all-iron, bronze-fitted, all-bronze or stainless steel units. Capacities to 150 GPM, heads to 115 ft. Send for catalog.

### COMPLETE LINE OF AIR CONDITIONING PACKAGE CHILLERS AND COMPONENTS

**PACKAGE  
 LIQUID COOLERS**  
 Completely integrated cooling units for apartments, commercial and industrial buildings, process work



**CENTRIFUGAL PUMPS**  
 Featuring exclusive, leak-proof "Remite" Mechanical Seal—quiet operation. Ideal for air conditioning installations.



#### EVAPORATORS AND CONDENSERS

Plus values in efficiency designing—built to ASME Code requirements.



**BELL & GOSSETT**  
 COMPANY  
 Dept. EW-45, Morton Grove, Illinois

Canadian Licensees: S. A. Armstrong Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

Circle No. 34 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

# WHY PAY MORE

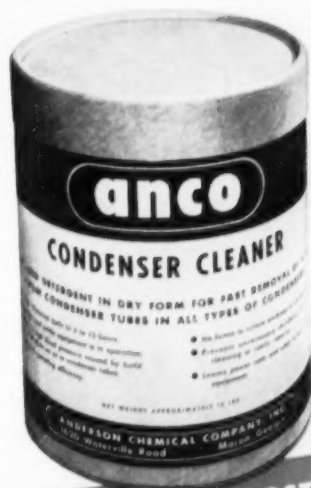
## FOR CONDENSER CLEANER WHEN THE BEST COSTS 30% LESS?

ANCO CONDENSER CLEANER is second to none for effectiveness, speed and safety, yet it costs about 30% less than other leading brands. This exclusive formula is simply dissolved in the sump while the system is in operation. Within a few hours, the condenser tubes are free of scale and head pressure is down to normal. ANCO is safe for servicemen to use and absolutely harmless to equipment. So why pay more when you can't buy better? Buy ANCO CONDENSER CLEANER and make more profit on every cleaning job.

### FREE!

#### WATER TREATMENT MANUAL

A complete booklet on the control of scale, rust and algae in refrigeration and air conditioning systems. No service department should be without a copy. It's yours for the asking.



**COMPARE THE COST**  
This 12-pound carton costs less than the 10-pound carton of other leading brands.

*Sold by wholesalers of air conditioning and refrigeration supplies*

**SPECIALISTS IN MAKING  
WATER BEHAVE**



**Anderson Chemical Company, INC.**

Box 1424 • MACON, GEORGIA • Phone 5-0466



Lock No. 4722



*announces the first major improvement  
in locks since "Living Action"*

## THE **ALL NYLON BOLT**



*"My customers go for  
the quiet, solid 'click',  
the smooth action.  
I go for the  
trouble-free operation!"*

Here is a brand new development in lock construction that really gives you something to sell! The new nylon bolt gives smoother operation . . . is quieter, longer wearing . . . makes doors easier to open and close with its "lubricated" action. Positive gasket seal is assured by our famous "living action" grip.

In addition, nylon is a non-conductor of heat or cold, does not mar strike. And GRBC gives you the superior copper-nickel-chrome finish, easy mounting design and trouble-free operation that let you keep your profits.

This combination of real, demonstrable advantages gives you more to sell . . . keeps on selling for you.

*For further details on Lock #4722 and other surface and  
edgemounted commercial refrigeration hardware write, wire, call*

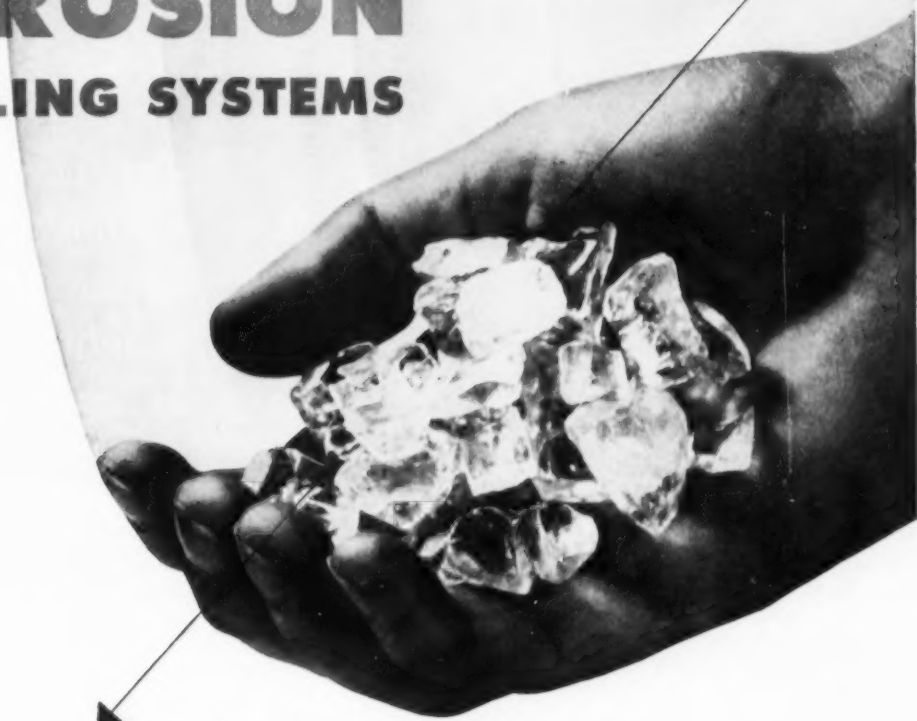
## **GRAND RAPIDS BRASS COMPANY**

*Division of Crampton Manufacturing Co.*

**GRAND RAPIDS, MICHIGAN**

Circle No. 32 on Reader Service Card

# END RUST SCALE CORROSION IN COOLING SYSTEMS



*with* **FORMET® CRYSTALS**  
*the most effective method ever used*

Formet Crystals will not only prevent scale formation and corrosion, they will *remove* existing deposits. Treatment is automatic—no proportioning devices needed—simply add Formet Crystals once a month.

#### Other Perolin Products for Cooling Systems

Perolin® Algae Preventive 905, in the form of convenient briquettes, can easily be placed in the sump or pan—for complete control of organic growths.

Pero-Klean® Dry Acid Cleaner 808 is recommended for the *rapid* cleaning of badly scaled equipment. Simple, safe and harmless formulation.



*The* **PEROLIN COMPANY, Inc.**  
Manufacturing Chemists

350 FIFTH AVENUE, NEW YORK 1, N. Y.  
1112 WEST 37th STREET, CHICAGO 9, ILLINOIS

**A HALF-CENTURY OF  
EXPERIENCE THE WORLD OVER**

THE PEROLIN COMPANY, INC.

350 Fifth Avenue, New York 1, N. Y. or 1112 West 37th Street, Chicago 9, Illinois

Gentlemen: Please send full information on Perolin's chemicals for Air Conditioning and Refrigeration systems. No obligation.

I have a \_\_\_\_\_ system, with \_\_\_\_\_ ton capacity.  
(TYPE)

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

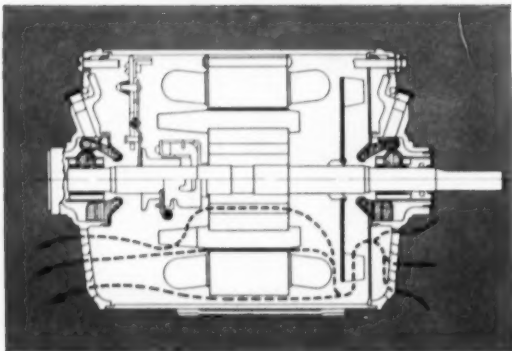
Circle No. 37 on Reader Service Card

**DESIGN ENGINEERS!**



This compact, cool-running fhp motor saves space and weight... mounts at any angle

## the **WAGNER "48"**



### OUTSTANDINGLY EFFICIENT COOLING SYSTEM

Schematic drawing shows how a large volume of air is directed through the motor to effectively reduce temperatures. Large blower at right draws air in through drip-proof openings in back endplate, forces it around back coil extension—through rotor vent holes—air gap—and through passages between stator core and frame. Cast blower at left circulates air around coil extension and drives it out the motor through front endplate openings.

Savings in space and weight are among the many advantages of using Wagner "48" capacitor-start or split-phase motors in your equipment. These motors come in the standard 48 frame sizes and weigh from 3 to 8 pounds less than the previous models in the same hp ratings.

Because no parts of the motor mechanism are housed in the endplates, it is possible to materially reduce their depth. An effective lubrication system assures positive protective lubrication for the bearings in any position. You can mount these motors at the angle best suited to your equipment.

The capacitor-start, Type RK "48" comes in  $\frac{1}{8}$  or  $\frac{1}{4}$  hp ratings, and the split-phase, Type RB "48" in  $\frac{1}{8}$ ,  $\frac{1}{4}$  or  $\frac{1}{2}$  hp. Both types are available with resilient bases or with rigid bases that are welded to the steel motor frames for ruggedness and strength. You can get these motors from leading motor distributors in your community and from Wagner sales offices in 32 principal cities. Check your telephone directory for the supplier nearest you. Write for your file copy of NEW Bulletin MU-217 on the Wagner "48".



BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

**Wagner Electric Corporation**  
6442 Plymouth Ave., St. Louis 14, Mo., U.S.A.

M57-13

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

Circle No. 38 on Reader Service Card

THESE

*McQuay*

## TWO UNIT AIR CONDITIONING SYSTEMS WILL

# MAKE SALES FOR YOU!



### REQUIRES NO WATER MOUNTS ANYWHERE OUTDOORS

This new McQuay outdoor type condensing unit with built-in hermetically sealed compressor is air cooled and requires no water. It mounts anywhere outdoors—adjacent to the foundation, in the breezeway or even on the roof. It is compact, quiet and efficient, with exceptionally high capacity. An indoor control panel, and hi-lo safety control is standard equipment.



Air Cooled Condensing Unit  
with built-in compressor

### 2, 3 and 5 Ton Capacities

#### *Air Conditioning*

##### WITH PLENUM INSTALLATION.

The McQuay vertical "RE-V" type evaporator utilizes the furnace blower. Suitable for all types of forced warm air furnaces including counterflow. All McQuay units are bonderized and attractively finished. Available in 2, 3, and 5-ton capacities to balance the outdoor condensing unit.



Vertical Evaporator  
for furnace mounting

OR

#### *Air Conditioning*

##### WITH DUCT INSTALLATION.

The McQuay horizontal "RE-H" type evaporator with forced warm air systems also uses the furnace blower. McQuay evaporators are also built in 2, 3, and 5 ton sizes to match the outdoor condensing unit. All are thoroughly insulated with fiberglass. Service panel and space for internal valve mounting is provided.



Horizontal Evaporator  
for duct mounting

OR

#### *Air Conditioning*

##### WITH REMOTE INSTALLATION.

The McQuay blower evaporator utilizes its own independent duct system, or may be used for direct air discharge. Ceiling mounted for use in systems lacking air capacity, 2, 3 and 5 ton capacities to match outdoor condensing unit. Drain pan for removal of coil condensate is built into all McQuay evaporators.



Blower Evaporator  
for ceiling mounting

**Gives you complete air conditioning  
for every possible job!**

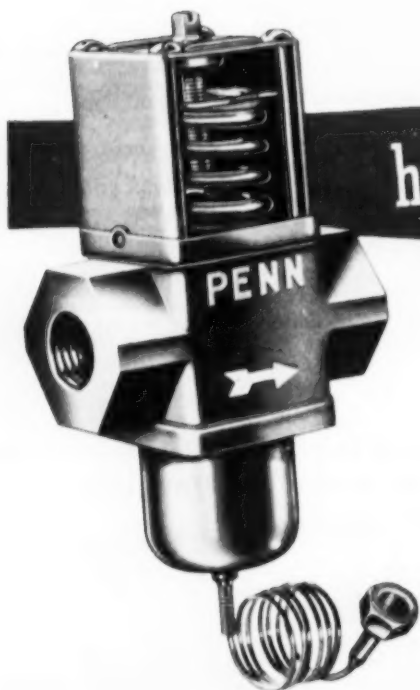
One of these new air cooled two unit McQuay air conditioning systems will enable you to meet any specifications on either new or existing jobs. They are highly efficient, low in cost, extremely quiet, and feature the exclusive McQuay ripple-fin construction. Get the jump on your competitors. Look into these two unit McQuay air conditioning systems and sell complete air conditioning—for every possible job. McQuay, Inc., 1643 Broadway St. N.E., Minneapolis 13, Minn. Representatives in all principal cities.

AIR CONDITIONING • HEATING • REFRIGERATION



*McQuay* INC.

# MORE MANUFACTURERS AND INSTALLERS BUY PENN THAN ANY OTHER WATER VALVE



here are the reasons why...

- No valve chatter
- No water hammer
- Easy manual flushing
- No rusting of range spring
- No corrosion of sliding parts
- Highly sensitive yet accurate

Add up these reasons and you'll get one answer... Penn water valves *stay on the job longer!* And, it's an answer proven correct in hundreds of thousands

of installations. Don't settle for something "almost as good"... specify and install Penn water valves. Ask your wholesaler or write to Penn Controls, Inc.

**PENN CONTROLS, INC.** Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

Circle No. 40 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

# IBNU'S

## TRENDS · OPINIONS · REPORTS

**ANOTHER APPLICATION** has been found for air conditioning. According to The Trane Co., air conditioning can provide the ideal conditions for storage of ammunition. Expert gunsmiths point out that ammunition should be stored in a cool, dry place, away from cement walls and floors. Also, it is wise to provide for free circulation of air around ammunition cases. Air conditioning, the company says, is the easiest way to meet these requirements.

**NEXT FROZEN FOOD** may be oysters, the Oyster Institute reports. Packaging must reduce or exclude contact with air before freezing is feasible. Storage life of oysters has been satisfactory for nine months with vacuum packaging, in which air is removed from the container. Experiments show that glazing with ice containing some salt protects quality almost as well.

**THE IMPORTANT WORD** "simultaneously" has been added to the official definition of air conditioning adopted by the American Society of Heating and Air-Conditioning Engineers. The new definition recommended is as follows: "Air conditioning is the process of treating air so as to control simultaneously its temperature, humidity, cleanliness and distribution to meet the requirements of the conditioned space".

**HISTORY OF 25 YEARS** in the industry is incorporated in the first issue of the new house organ by Sweden Freezer Mfg. Co., which is marking its silver anniversary year. Six issues a year will be published. Harvey F. Swenson, president, began experimental work in Seattle in 1931, and actual production followed the next year of the first of a long line of small freezers to make fresh ice cream for consumption on the premises.

**PROBABLY THE BIGGEST** fleet of air conditioned buses of any city in the United States is being operated by St. Louis Public Service Co. Seven of the company's 19 express lines have a total of 100 air-cooled vehicles in operation. If patronage increases 10 to 15%, the firm plans to cool the entire fleet. The program cost \$300,000, according to a company official.

**A COLD VAPOR** heating system in which a gas normally used as a refrigerant is piped through radiator coils in place of water may provide a better and faster method of warming up churches, garages and other buildings that need only intermittent heating. By substituting the refrigerant for water in heating coils and adding a shell and tube heat exchanger to the normal coil, oil or gas-fired boiler, the cold vapor system can raise temperature in a large building as much as 34 F in 1½ hours, roughly 6 to 7 times faster than conventional hot water heating. The system was developed by a Swiss firm, Carba.

**FIRST COMPLETE INSTALLATION** of aluminum-clad storage doors has been made at the warehouse of Food Fair Stores, Inc., Miami, Fla., according to Jamison Cold Storage Door Co., the supplier. This represents the largest, single installation of such doors. Principal advantage of the 16 and 26-gauge aluminum cladding is a savings in weight. Important, because many of the doors are large double units 6 x 8½' in size.

# Make Your Servicemen Proud



## TRAINING

Servicemen listen attentively as Rollei Hauth, service manager of Hattenbach Co., explains the operation of a new line of ice cream cabinets during one of the company's regular service meetings.

The men are encouraged to offer suggestions and air their "beefs". Harry Hattenbach (standing by door), a partner in the firm, demonstrates his own interest in the program by his attendance.

**H**OW are your servicemen treated? Are they made to feel equal to the sales force or as important as your office personnel? Is their contribution taken for granted?

Hattenbach Co., a leading Cleveland commercial refrigeration distributor, considers such questions very vital to the successful operation of its 13-man service department, one of the largest in the city. Believing that everyone deserves a "pat on the back for a job well done, regardless of whether he wears a service uniform or a white shirt and a dress suit," Harry Hattenbach, a partner in the firm, always has made a particular point of giving due recognition to his service force.

"As in any occupation, the more education and training a man receives for that job the more suc-

cessful his performance will be," says Hattenbach, "and if a little sincere expression of appreciation will help make his job more pleasant or easier, it is to our advantage as well as his to see that he gets it."

Just such training and recognition is given to Hattenbach's servicemen at a semi-monthly meeting which the service manager conducts after working hours.

Attendance at these meetings is voluntary, but absenteeism certainly is not the rule. Rarely is anyone absent without good reason. Incidentally, Hattenbach himself usually sits in on at least a portion of every meeting, as an evidence of his interest in this training program and his recognition of its importance.

"Although we do not pay the men extra for attendance," we believe that they realize these meetings are to their benefit, he explains, whether they remain

# of Their Job

Here's how one distributor  
applies a three-factor  
program to make service a  
top-profit activity



## COMPENSATION

The boss himself presents bonus checks to happy servicemen Steve Zak (center) and George Dunbrook. Checks are based upon revenue from the company's program of maintenance contracts.



## RECOGNITION

Pat on the back for a job well done is given by Harry Hattenbach to servicemen Ed "Lefty" Fern (left) and Joe Hessoun. Photo of the outstanding installation is framed on the office wall.

with our organization or move elsewhere. Naturally, we are impressed with those men who show the most interest and are eager for the extra training.

"These meetings help to unite and boost the morale of the servicemen and give them prestige equal to that of any of our other employees. We are able to offer them more training assistance, and by devoting a part of each get-together to a question-and-answer session many problems can be cleared up," Hattenbach says.

The servicemen continually are reminded that they have a vital position with the firm and that their contribution to it is appreciated. They are encouraged to freely air any "beefs" that they might have, and everything possible is done to understand them and to resolve the situation satisfactorily for all concerned.

At about every third meeting, a manufacturer's representative is invited to help educate the men on the various service features and problems of products installed and serviced by the firm. Films, charts and other visual aids are used wherever possible to dramatize these presentations.

"Sometimes the service meetings produce ideas that are adopted by the company and result in a more effective service operation," says Hattenbach. "One such suggestion adopted was to attach on or near each unit serviced a small card on which servicemen can record trouble spots checked on each call. Often it is impossible for the same man to check the same unit a second time, but this card supplies the history of exactly what was done previously."

*Continued on page 55*

# Give 'em Air

## ... and plenty of it!

Two 30,000 cfm ventilating systems provide efficient and economical operating conditions for the 28 air cooled condensing units in this Toledo supermarket

**L**ICK the air handling problem and you've overcome the one drawback in using remote air cooled condensing units to handle the refrigeration requirements of large supermarket installations.

The basic problem lies in locating these units in such a way that enough fresh air can be pulled through the condensers to lower the refrigerant temperature sufficiently to keep compressor head pressures and operating efficiency under control. Also, of course, it is important for the hot air coming off the condensers to be dissipated in such a way that it will prove no handicap either to the operation of the store or of the refrigeration equipment itself.

Floyd I. Davison, head of Davison Associates, Inc., one of the top commercial refrigeration distributors in Toledo, Ohio, firmly believes he has found the answer to this problem in the complete supermarket job that his organization recently planned and installed for the newest unit of Oscar Joseph Stores, Inc. This new Joseph's market, which opened early this year, is located in the Great Eastern Shopping Center, on the city's eastern edge.

Davison's solution was as simple as it was effective. He simply planned for adequate ventilation of the two machinery rooms in which the air cooled condensing units are located. That in itself is nothing new, of course. But the way in which it was done, in this case, may well prove a sales clincher for other dealers faced with a similar situation.

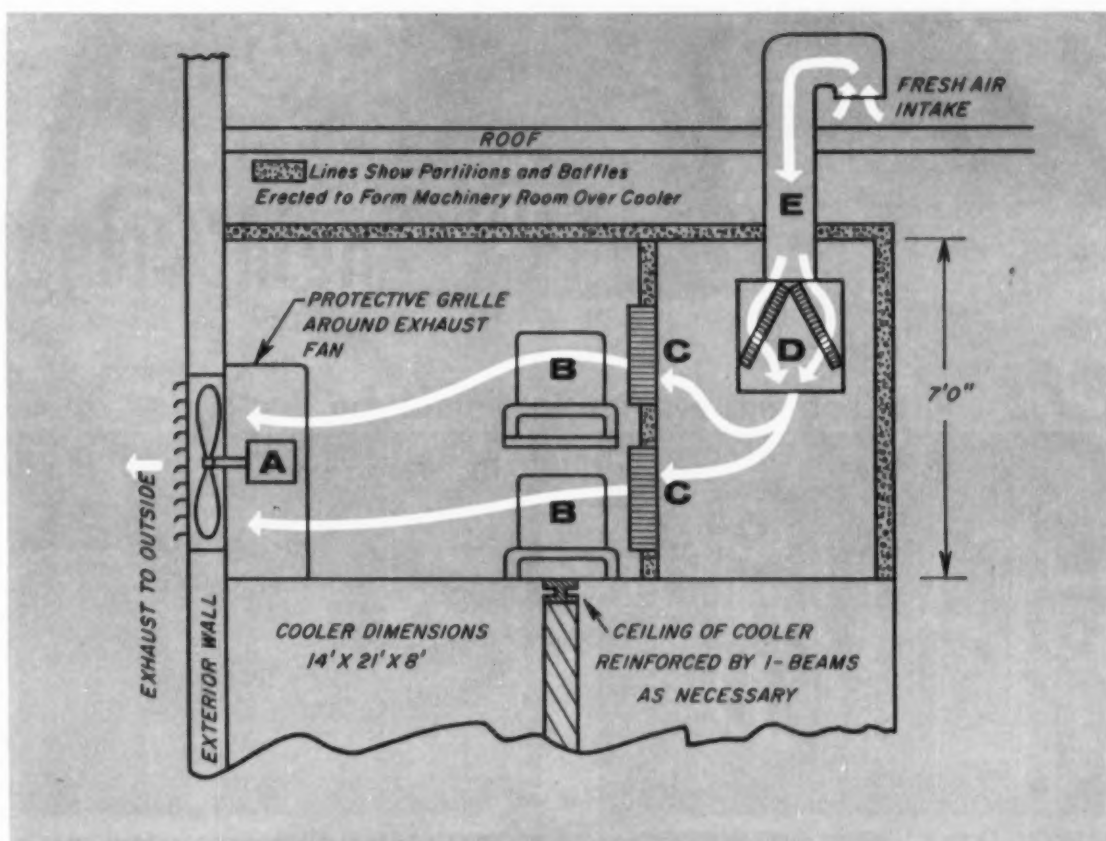
The market measures 120' wide by 200' deep. The actual shopping area runs only 150' deep, with the remaining 50 x 120' space at the rear being utilized for both refrigerated and dry bulk storage and the location of mechanical equipment. The shopping area is completely air conditioned by a central system.

Completely Friedrich equipped, the market boasts a total of 45 display and merchandising cases of all types, and six coolers of varying size to handle the store's refrigerated bulk storage requirements. These cases and coolers are powered by a total of 28 remote air cooled condensing units, ranging in size from 1 to 5 hp, with a combined rating of 78 hp.

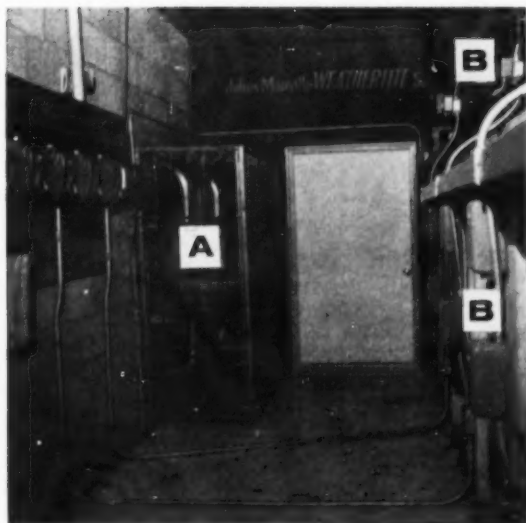
The case lineup breaks down as follows: five 11' and one 8' produce cases, operating with one 5-hp air cooled condensing unit; fifteen 11' and one 8' frozen food cases, and three 11' ice cream cases, using ten 3-hp, one 2-hp, and one 1½-hp condensing units; six 11' dairy cases, powered by two 3-hp units; nine 11' meat cases and five 8' meat cases, using one 5-hp, one 3-hp, one 2-hp, and three 1-hp units.

On the bulk storage side, the market has the following refrigerated facilities: a 20 x 24' meat cooler powered by two 3-hp condensing units; an 8 x 20' dairy cooler operating off one 2-hp machine; a 15 x 21' freezer using one 5-hp unit; an 11½ x 28' produce cooler using a 3-hp unit; an 8 x 30' beverage cooler equipped with a 3-hp unit; and a 6 x 12' bloom box

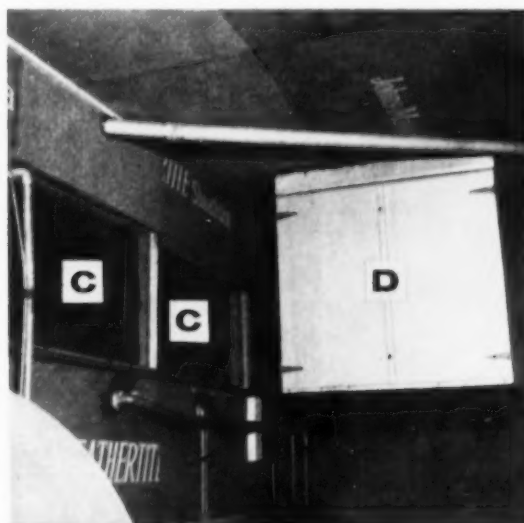
*Continued on page 69*



**AIR FLOW PATTERN** of a typical ventilating system such as employed to cool the machinery rooms in the new Joseph's market is clearly indicated by the white arrows in this schematic diagram. Fresh air is drawn in through a roof-mounted intake (E), past the cleanable filters in the filter cabinet (D) mounted in the plenum section of the equipment area, through the air cooled condensers (C), past the compressors (B), and is exhausted to the outside through the wall-mounted fan (A).

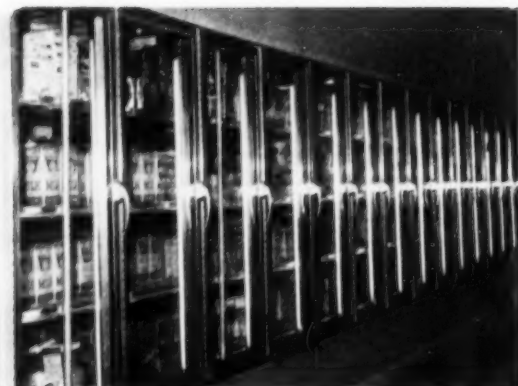


**THE 30,000 CFM FAN (A)**, mounted in the outside wall of the machinery room located atop the produce cooler pulls plenty of fresh air past the double-decked condensing units (B).



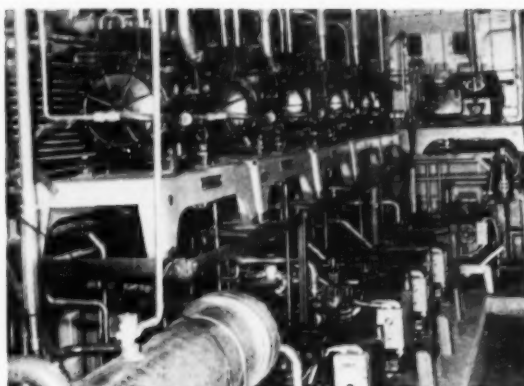
**INCOMING FRESH AIR** from the roof-mounted intake is cleaned by six permanent filters installed in the filter cabinet (D) before being drawn through the air-cooled condensers (C).

# "Problem Engineering"



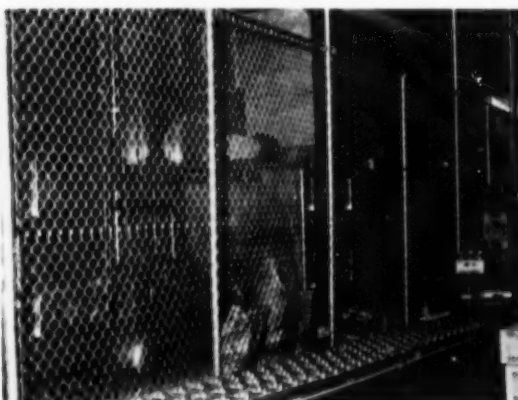
**PROBLEM:** To provide additional display for dairy products in a supermarket that had outgrown its original refrigerated storage and display facilities.

**SOLUTION:** As part of a 112 x 30' concrete-block addition outside the store's walls, Dennhardt built into one side of the store a 30' length of dairy display reach-in space, eight levels high. Up to three days' volume is stocked.



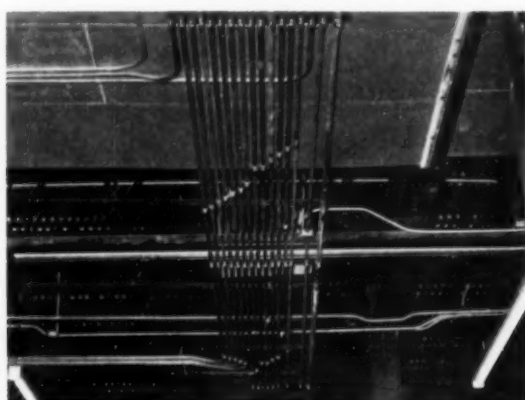
**PROBLEM:** To locate all refrigeration equipment serving a supermarket in a separate "refrigeration center", occupying minimum space and simplifying maintenance.

**SOLUTION:** Here are 15 condensing units, double-racked in a compact, neat installation that takes up the smallest space possible. All controls and accessory equipment also are located here, and are readily accessible for servicing.



**PROBLEM:** To protect a basement "refrigeration center" from being damaged or having its efficiency impaired by employees loading crates, cartons, etc., around equipment.

**SOLUTION:** Dennhardt had the management of the market install a high, heavy wire fence, similar to that used to fence-in back yards, along the aisle next to the "refrigeration center". Now there's no chance of damage.



**PROBLEM:** To make a neat, workmanlike installation of some 8,000' of copper tubing required to serve a supermarket's remotely located refrigeration equipment.

**SOLUTION:** Refrigeration tubing lines were run across the ceiling of the market's warehouse area, from the individual cases to the machinery room. Note the neatness and symmetry of the lines, their handiness for servicing.

# Pays Off



**STUDYING** his customers' problems beforehand helps Chester Dennhardt avoid future trouble spots.

here are some typical ways this dealer uses advance planning to boost his sales

**"P**ROBLEM engineering" to meet the special — and specific — problems of larger supermarket operators has been responsible for a growing list of "plush installations in food stores for Dennhardt Refrigeration Co., Denver contractor-dealer.

Installations running up to \$50,000 or more are almost "everyday stuff" with Chester Dennhardt, refrigeration engineer who heads the organization. During the past 20 years, beginning as a service mechanic, Dennhardt has been purchasing agent, refrigeration engineer, and over the past five years, a highly active contractor serving only two fields — specialized refrigeration equipment for major supermarkets in the 20,000 sq. ft. and up classification, plus commercial and residential air conditioning.

Through the years, the Colorado contractor has made it a practice to "live with" the supermarket industry. Whenever he isn't at the drafting board, calling on prospects or supervising an installation, he is most likely to be out "sniffing around" mass-turnover food stores with an eye toward understanding operating problems and developing solutions.

As a result, Dennhardt has been able to set up an unusually close degree of cooperation with supermarket operators, so that he is often called in on the original market planning operation, rather than long after the architect has laid aside his blue prints. The reason is simply that Dennhardt cheerfully does the entire mechanical drafting job for his supermarket plan, covering every aspect of refrigerated storage, processing, sales areas, maintenance, etc., excluding only the electrical wiring. This is a tall order in many instances, particularly when dealing with several of Denver's largest supermarket chains, but it has paid glittering dividends.

Typical of Dennhardt's ability to aid his supermarket customers in combating serious problems was the Brentwood store of King's Sooper Markets, of Denver. In this instance, the chain had leased a 15,000 sq. ft. store in a shopping center which, after less

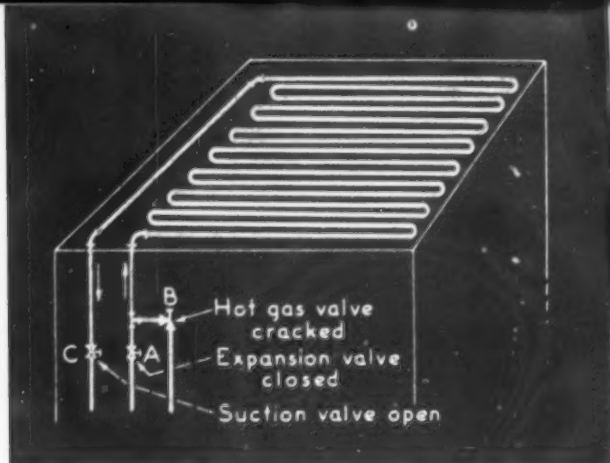
than a year of operation, was woefully short of refrigeration space, both from a storage and a display standpoint. A housing boom built around budget-priced tract homes nearby had zoomed the market potential tremendously; and with a heavy demand for frozen foods, meat, dairy products, etc., the Brentwood store was constantly and embarrassingly "running out" during peak periods.

After studying the situation which showed absolutely no space within the store available for expansion, contractor Dennhardt came up with a novel solution. This was the construction of a 112 x 30' concrete block addition *outside the walls*, which would serve as a "refrigeration center" from a storage standpoint, and also meet an unprecedented heavy demand for dairy products through providing a 30' long reach-in dairy box, along the left side of the store.

Unable to expand physically in any other direction, the King's Sooper store has gained all of the refrigeration capacity for a supermarket twice as large by construction of the insulated, concrete block "refrigeration center". Occupying what had been little used parking space at the side of the building, the structure incorporates a 50 x 8' walk-in, reach-in dairy products box for both display and storage, a 25 x 25' produce walk-in and a 30 x 20' frozen foods walk-in, plus an oversize "trash room," storage closet, and a broad, convenient access corridor to the parking lot outside.

Probably the most unusual feature of this "added on" refrigerated space is the dairy products display refrigerator. This consists of a huge blonde-hardwood enclosure, extended out 3' from the original market wall and built around the 50 x 8' opening cut out of the former wall, where a row of portable type refrigerated dairy products display cases had stood. By projecting the wood enclosure out to this distance, contractor Dennhardt was able to add 30' of continuous dairy products display in eight levels behind 16 Weber

*Continued on page 109*



## 5 Ways You Can...

# LICK THE DEFROSTING PROBLEM

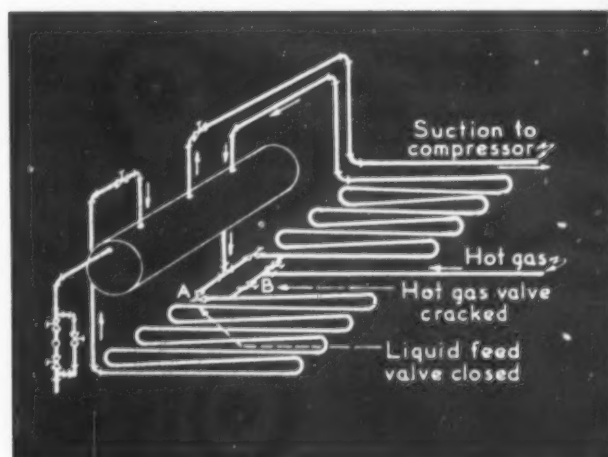
**P**REVENTING the accumulation of heavy frost and ice on the cooling coils in commercial coolers and freezers often is a serious problem. Unit coolers and banks of direct-expansion brine coils frequently are sized with just enough capacity to meet maximum load conditions. This means that if frost or ice builds upon these coils sufficiently to impair their efficiency they no longer can adequately handle the job they were designed to do.

Periodic defrosting of these coils is the simplest answer to this problem. There are many defrosting methods, but this article will cover only the more common ones for ammonia coils using direct expansion and for isolated brine coils.

Let's take a closer look at this problem. During periods of cool weather or light loads it is easy to overlook the light layer of ice or frost that may be gradually insulating these evaporating surfaces. Then, when a sudden hot spell or some other rapid load increase comes along, this refrigeration system is in trouble. Without standby equipment, evaporating pressures cannot be dropped in order to raise the temperature differential.

When evaporating surfaces are partially insulated with frost or ice, the rate of heat transfer or absorption by evaporation depends upon thermal conductivity, all other factors being equal.

Let's assume, for example, that we have a cold storage room piped with 1000 sq.ft. of 2" direct-expansion coils. Suppose it's figured on a heat transfer coefficient from still air to evaporating surface of 2 Btu per sq.ft. per hour per degree F.



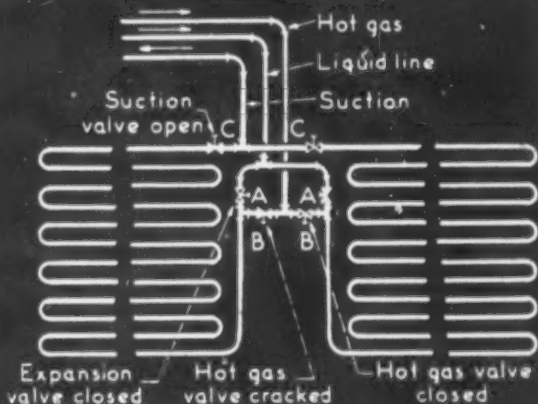
Let us further assume that room temperature is 30 F and refrigerant temperature is 5 F, making a temperature differential of 25 degrees. Refrigerating capacity under these conditions would be:

$$\frac{1000 \times 2 \times 25}{12,000} = 4.16 \text{ tons}$$

Now, if the coil is covered by 2" of fine, dry frost, the coefficient of heat transfer might be as low as 0.9 Btu per hour. From this it is evident that the capacity of the coil would be reduced to at least 60% — and

FIG. 1—Simple direct expansion ceiling coils are defrosted by running hot gas directly from compressor through coils.

FIG. 2—Side-wall direct expansion coils defrost with hot gas to one set of coils while the other set holds temperature.



**H**ERE are five common methods of defrosting direct expansion ammonia and isolated brine coils in commercial coolers and freezers. One of them may well meet your specific needs on your next cold storage job.

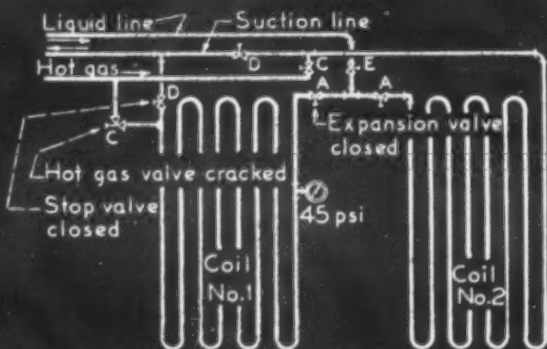
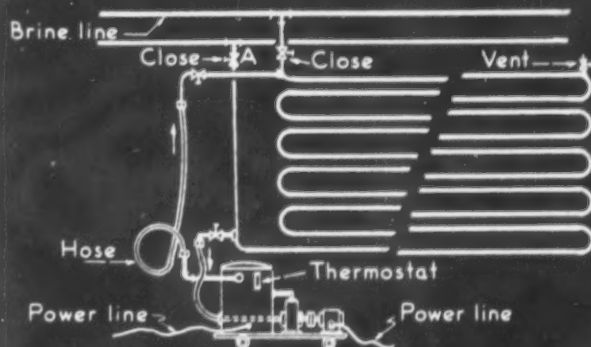


FIG. 3—Large direct-expansion system is defrosted by using hot gas of 40 to 45 psi on one side, then feeding liquid to second coil.

Fig. 4—Direct-expansion flooded system coils are defrosted by closing liquid feed valve and cracking hot gas valve.

FIG. 5—Brine-coil system is defrosted by isolating coils and pumping in hot brine with the portable defroster unit.



possibly even to as low as 45% — of its original capacity.

Don't forget that frost conditions vary greatly, from fine-dry to heavy-wet ice coatings. The blanketing effect of dry frost is seen when a heavy snow lies over a wheat field for weeks. Despite near-zero cold, the grain remains green and frost penetrates the underlying earth less than an inch. In old plate ice-making systems, where ice was frozen on one side of a steel plate in cakes measuring 12 x 16' by 12" thick, 3 or 4" of ice would form in the first 24 hours at zero

evaporating temperature. Yet, it would take from 160 to 175 hours to completely freeze the 12" thickness, due to the insulating effect of the ice blanket.

These examples graphically illustrate why evaporative surfaces — whether in the form of unit coolers, piping, or brine cooler tubes — must be kept clean if they are to operate efficiently. Formation of frost, rust, or scale on such surfaces greatly reduces their cooling capacity.

The following paragraphs describe some of the more  
*Continued on next page*

## DEFROSTING

common methods employed for the defrosting of direct expansion ammonia coils or isolated brine coils.

**Simple ceiling coil** (see Fig. 1) with hot gas connection to liquid feed *above* the expansion valve. To defrost, close expansion valve A and feed hot gas from ammonia condensing system through valve B. Keep stop valve C open.

**Side wall coils** with hot gas line connected *below* expansion valve (see Fig. 2). To defrost, close expansion valve A on one coil and crack hot gas valve B, leaving stop valve C open.

Another way is to close expansion valve and stop valve C on one coil and feed hot gas into the coil until pressure reaches 40 or 50 psi. This works well with heavy ice formations. Take extreme care when putting coils back on line to open stop (suction) valve C slowly, until pressure equalizes the system. If valve is opened quickly, slugs of liquor (accumulated in coil during defrosting period) may carry into compressor, damaging machine.

**Large hot-gas system** connected to suction end of coils (see Fig. 3). To defrost coil No. 1, close expansion valve A and stop valve D, isolating coil from system. Crack hot gas valve C, feeding hot gas to coil until 40 to 50 psi is reached. After coil defrosts, close stop valve E in liquid line and open expansion valve. Accumulated liquid in coil is then fed through two expansion valves to coil No. 2.

To defrost coil No. 2, reverse process. On large systems, this method works very well. It doesn't upset normal operation, and it eliminates the danger of liquid reaching the compressors.

**Flooded system with accumulator** (see Fig. 4). This system is best for cold storage spaces with constant variations in load, as entire piping system is flooded with liquid refrigerant. This prevents sections of coil from losing frost under rapid changes of room temperature and dripping down on commodities in storage. Many of these systems have been installed

in rooms having an area (floor space) of 5000 sq.ft. or more, with coils placed on 10" centers and suspended from roof or ceiling beams.

Take precaution in piping this system. Never place liquid drains less than 2" from accumulator. On automatic systems, it is found that the large volume of refrigerant held by coils will keep room temperatures for longer periods after compressors have shut down. This results in over-all higher average backpressure.

To defrost, close liquid drain valve A (feed valve) from accumulator. Let coil stand for 2 or 3 hours, so most of the liquid refrigerant in coil evaporates. Then crack hot gas valve B. Liquid form-



ed in coil by hot gases condensing is driven into accumulator. This hookup is one of the most efficient and simple of all evaporating systems.

**Brine coils**, (see Fig. 5). Some cold storage plants have warm brine lines running to various coils for defrosting. That's an expensive and complicated layout.

Use a portable defrosting unit with a 50-gallon closed tank mounted on a hand truck. Hook it to a small, low-head pump, direct-connected to a 1-hp motor. Fit three immersion water heaters (115 volt, 500 watt) in tank. Connect hose lines from defrosting unit to defrosting valves on coil.

To defrost, close stop valve A on coils, isolating coil from system. Circulate brine in tank (heat-

ed by immersion strips) through coil. Isolated coils are easy to defrost by this method. Installing brine connections on coils, and electrical outlets to service the defroster, is often simpler and less costly than installing long, warm brine pipes from heat exchanger in plant.

When planning and operating defrosting systems, certain precautions should be observed. In ammonia work, for instance, make gas lines of 1/2" or 3/4" extra-heavy pipe, as these lines may be at condenser pressures. Support these lines securely, while at the same time allowing for free expansion and contraction through masonry walls or insulation. Install stop valves at condenser header, and keep closed when system is shut down.

When defrosting, feed hot gas slowly. Fully opened gas valve may set up heavy expansion stresses where coils are frozen solid to pipe supports. This may cause leaks to develop and fittings to break.

Don't melt off frost and ice formations completely. After coils reach 40 to 50 F, remove balance of ice crust with scraper. Most of it will drop off like ice from a thawing telephone pole.

Lead gaskets "iron out" on high pressure sides and cause oil seepage. On evaporating system, lead gaskets usually leak where coils are frequently defrosted.

Mechanical rubber-sheet gaskets are easy to cut and give better results. These packings are oil proof and have an asbestos fibre binder or other compounds as a matrix. They endure wide temperature variations without leaking oil, liquid or gas.

In making up flanges, pull up bolts square and solid, but don't over-stress. See that joint surfaces are clean and use 1/16-in. gasketing.

Defrosting systems which are properly planned, installed, and operated will keep your customers happy and will result in a minimum of emergency service calls to disrupt the normal routine of your business operations.

**BUY FROM YOUR  
REFRIGERATION WHOLESALE**

## SERVICEMEN . . .

*Continued from page 47*

Always intent upon giving recognition to his service and installation crews, Hattenbach arranges to have photographs taken of any particularly outstanding installations performed by them. Copies of these photos used to be presented individually to the men concerned, but the great frequency of excellent jobs made this practice a bit impractical. However, these pictures are displayed on the walls throughout the various offices at Hattenbach's headquarters.

Good appearance by his men on the job is another of Hattenbach's prime concerns. Rented uniforms are supplied, with the servicemen paying for only one-half of the rental cost. This means a cleaner uniform more often, and a neater appearance of the men while on their service calls. The men appreciate this convenience, he says — and so do their wives. Not only does this policy give the wives a

better impression of the company for which their husbands work, which in turn helps to build their husband's morale, but also the housewives are relieved of the chore of washing the uniforms.

The servicemen enjoy still another benefit in the form of a bonus arrangement. Twice a month they divide up a kitty based on 5% of total sales from the certified maintenance contracts handled by the company.

A second bonus annually is offered to the supervisory help. This is based upon a certain percentage of the profits of the service department.

"Our men receive a salary equal to that of any other serviceman in Cleveland, and probably higher than most," Hattenbach declares, "but our experience has shown us that in the final analysis such a practice pays off handsomely for the management as well as for the employees."

**BUY FROM YOUR  
REFRIGERATION WHOLESALE**

## PATENT GRANTED ON "TUFF-WELD" HANGER

Goodloe E. Moore, Inc., of Danville, Ill., has been awarded U.S. Patent No. 2793887 on its two-piece "Tuff-Weld" insulation hanger. The hanger consists of an all-nylon base plate  $1\frac{1}{8}$ " in diameter and a metal spindle in four lengths from  $1\frac{1}{8}$ " to  $3\frac{1}{2}$ ". Spindles are pushed through the base plates and snapped into place just before the two-piece units are to be attached to a duct with adhesive.

## SERVICE PARTS NAMED HYDRALINE DISTRIBUTOR

Service Parts Co., Melrose Park, Ill., has been appointed wholesale distributors for the Hydraline Products of the York Div. of Borg-Warner Corp. Products to be handled by Service Parts Co. include central system water chillers, remote air conditioners and refrigeration units for application to both residential and commercial buildings.



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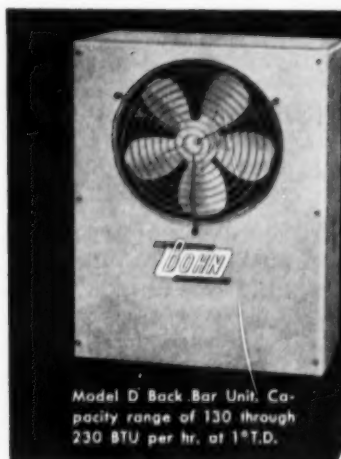
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WALK-IN COOLERS BEVERAGE COOLERS DIRECT DRAWS CUBE MAKERS DRAWBOARDS

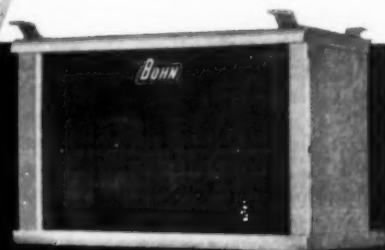
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Circle No. 42 on Reader Service Card

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Model D Back Bar Unit. Capacity range of 130 through 230 BTU per hr. at 1°T.D.



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Model HR Half Round. Capacity range from 260 through 1080 BTU per hr. at 1°T.D.

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Circle No. 43 on Reader Service Card

# useful BULLETINS BOOKLETS CATALOGS

**NEW CONCEPT** in the refrigeration of fresh food is introduced in 12-page Bulletin TV-380 covering the "F" Thermobank by Kramer Trenton Co., Trenton, N.J. Discussed in detail is refrigeration for the ideal storage of meat, fruits, vegetables, and dairy products. Complete information is given on the re-evaporative automatic hot gas defrost system which is said to maintain economically constant temperature and humidity at the 30 or 32-degree level.

Circle No. 120 on Reader Service Card

**SIMPLICITY OF INSTALLATION** and maintenance of its line of cast aluminum ice plates for cooling liquids with ice is covered in a bulletin by Heat-X, Inc., Brewster, N. Y. Listed are the various capacity in which the plates are available. "In use" operation of the units is explained and illustrated in some detail.

Circle No. 121 on Reader Service Card

**NEW SELLING FEATURES** for its selection of display cases are enumerated in circular by Evans Mfg. Corp., Mt. Vernon, N.Y. Photos show models with and without merchandise. A specification table is provided for these dairy and beverage wall cases.

Circle No. 122 on Reader Service Card

**DESIGN AND PRICE INFORMATION** on the Thermo-Panel coil is made available in Bulletin No. 257 by Dean Products, Inc. Readers are offered important tips on how to make their own estimates and how to do their own designing. Information also is given on lengths, widths, hangers, handles, treatment, metalizing, welding, etc.

Circle No. 123 on Reader Service Card

**CONDENSED CATALOG CC-1** on its commercial refrigeration products now is obtainable from Betz Div., Bohn Aluminum & Brass Corp., Danville, Ill. Publication covers expanded commercial line, along with dimensions, connections, and shipping weights.

Circle No. 124 on Reader Service Card

**SET OF SIX** specifications covering application of "Foamglas" insulation for use on industrial equipment and piping is available from Pittsburgh Corning Corp., Pittsburgh, Pa. Each booklet contains drawings of installation procedure, insulation supports, and recommended finishes.

Circle No. 125 on Reader Service Card

**REFERENCE TABLE** for engineers and other executives is available in wall chart form from Precision Equipment Co., Chicago. Common conversions are included such as inches to centimeters or watts to horsepower, as well as many conversions that are difficult to locate in reference manuals.

Circle No. 126 on Reader Service Card

(More Useful Literature on page 58)

New...from Borden!

## PLACCO

insulation products  
you can depend on!



**Placco White Cork-Coat.** This white, one-component system, plaster coating assures top results in refrigerator insulation jobs. Ready to use, it can be applied by trowel over cork slabs or Styrofoam. Good water resistance, can be washed down by hose.

For Cold  
Storage  
Insulation



**Placco Rubber and Rubber-Asphalt Cements.** Recommended for sealing joints and filling seams for highest efficiency of insulation. Fast setting, non-flammable and easily applied with resistance to high and low temperatures. Adheres readily to metal, glass, asbestos and other insulating materials.



**Placco Thermo-Tite.** Produces a top-quality protective finish. For application over exposed insulation such as fiberglass blankets, mineral wool blankets, calcium silicate block, asbestos block, foam glass block and magnesia block. Waterproof, fire-retardant, withstands extreme temperature variations.

For Air  
Conditioning  
Insulation



**Placco Insulation Adhesives.** You'll get stronger, longer-lasting bonds. Especially designed for bonding fiberglass, felt, and other insulation to heat and air conditioning pipes and ducts. Works well on metal, wood, glass. Waterproof... fast grab... ready to use as received.



For further information write: The Borden Company, Chemical Division, Coating and Adhesives Dept., Middlesex, N. J.



IF IT'S **Borden's**  
IT'S GOT TO BE GOOD!

Circle No. 44 on Reader Service Card



Saws openings for ducts through plates, sub-floors or studs . . . easy . . . fast!

## Nothing like it for sawing duct openings **FAST!**

Milwaukee's SAWZALL ends tedious back-breaking hand sawing in walls, floors, and ceilings. Needs no starting hole in wood and like materials . . . plunge-cuts right in! Only 6 $\frac{3}{4}$  lbs. 14 $\frac{1}{2}$ " long. Gets into tight spots . . . guides easily with one hand. Quickly pays for itself. Super-powered by a Milwaukee-built  $\frac{1}{4}$  hp motor. Cuts at 2250 strokes a minute.

Over 35 SAWZALL blade types for all materials. With assorted blades and steel carrying case . . . only **\$89<sup>50</sup>** NET

For free demonstration see your Milwaukee distributor, or write for folder SW6.

**MILWAUKEE ELECTRIC TOOL CORPORATION**  
5310 W. State St., Milwaukee 8, Wis.

# Milwaukee

## SAWZALL

No. A7-9246

Circle No. 46 on Reader Service Card

### USEFUL LITERATURE . . .

*Continued from page 57*

**COMPLETE RANGE** of water coolers — concealed, remote, and cabinet models — is set forth in comprehensive Catalog 57a issued by Filtrine Mfg. Co., Waldwick, N.J. Illustrations, and rough-in drawings with detailed dimensions are featured. Also presented is engineering data for the selection and installation of all types of water-cooling equipment to serve from 1 to 500 outlets and typical architects' and engineers' specifications.

Circle No. 127 on Reader Service Card

**REPRINTS OF ADVERTISING** in booklet form combine to tell the story of all of the significant steps involved in the making of copper tubing by Viking Copper Tube Co., Cleveland. Promotional material is titled, "There Is a Difference in Copper Tubing".

Circle No. 128 on Reader Service Card

**A SANDWICH PANEL** usually with a plywood core and metal facings (Weldwood Armorply) is the subject of a brochure by United States Plywood Corp., New York, N.Y. Many combinations of this laminate are described. Also studied are a series of tests demonstrating simple-beam bending test, plate bending, twisting shear, and edgewise compression loads test. Typical results are given for single construction.

Circle No. 129 on Reader Service Card

(See page 98 for Air Conditioning Literature)

### MAKE YOUR OWN SCALE REMOVER!

Galvanized strips dipped in acid solutions of equal strength.

with

## VAPCO-HIB

**Acid Inhibitor**

Just add it to muriatic acid. Gives fast, low cost descaling with unbelievable safety to metal surfaces—even galvanize!



Galvanize completely stripped in less than 30 minutes **without** Vapco-Hib.



Galvanize still intact after 24 hours in similar solution, but **with** Vapco-Hib.

NOW, FOR THE FIRST TIME — the low cost, fast descaling action of muriatic acid . . . with the safety of a dry powder cleaner, Vapco-Hib sets up a chemical reaction which forms a protective barrier on metal surfaces, yet does not retard cleaning action on scale deposits. Complete information and directions on bottle. Available in 8 oz. and 32 oz. sizes. Ask your wholesaler or write us today.

**Other Vapco Products:**

- DRY POWDER CLEANER
- SLIME-X
- PHOS-NUGGETS
- ICE MACHINE CLEANER

**GARMAN CO., INC., St. Louis 23, Mo.**

Circle No. 45 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

## HELPS YOU SELL THE AUTOMOTIVE AIR CONDITIONING MARKET...

This advertisement, currently appearing in automotive trade journals, is your introduction to service managers who will be looking for a local source of supply for Trona refrigerants.



SO EASY TO KNOW EXACTLY WITH THE TRONA\*

# CHARG-A-CHART\*



American Potash & Chemical Corporation

REFRIGERATION DEPARTMENT

3030 W. 6TH STREET, LOS ANGELES 54, CALIFORNIA  
99 PARK AVENUE, NEW YORK 16, NEW YORK

## TRONA



Why guess? Know *exactly* the proper refrigerant charge for factory-installed and independent air conditioning systems...and know it *quickly* with the convenient new Trona CHARG-A-CHART! A glance gives you the information you need to do the job *perfectly*. Get ready for the *increased* air conditioning business you'll be doing with "Freon-12"† automotive refrigerants available in convenient Trona Charg-A-Can\* disposable containers and bulk cylinders. Trona refrigerants are stocked and serviced by your local refrigeration wholesaler. Contact him today!

†TRADEMARK OF E. I. DUPONT DE NEMOURS & CO., INC. \*TRADEMARK APAC

SO EASY TO GET  
YOUR CHARG-A-CHART\*...  
JUST FILL OUT AND  
MAIL TODAY!

AMERICAN POTASH & CHEMICAL CORPORATION  
3030 West Sixth Street  
Los Angeles 54, California  
Please send me my free copy of the  
new Trona CHARG-A-CHART.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

# NEW PRODUCTS

For further information on any of these products, simply circle on the postcard provided in this issue the key numbers of the items in which you are interested. Your request will be forwarded directly to the companies concerned.

(For Air Conditioning Products turn to page 102)

## Circulating Unit

**Product:** Addition of "Air-Cel" circulating unit to regular line of refrigeration equipment.

**Manufacturer:** Dole Refrigerating Co., Chicago, Ill.



**Features:** When used with static plates will increase heat transfer coefficient and provide uniform temperatures in any refrigerated truck body. Moving air, circulated within truck body by unit, over the hold-over plates will insure even distribution of refrigeration over product, manufacturer says. Truck battery supplies power while on road. Standard A/C 110V current may be used other times. Snap switch and pilot light for dashboard mounting.

Circle No. 154 on Reader Service Card

## Air Motor

**Product:** Air motor which makes possible practical diamond drilling without electric power.

**Manufacturer:** Truco Water Swivel Div., Wheel Truing Tool Co., Detroit, Mich.

**Features:** Motor can be used in atmospheres which, because of their gas, vapor or dust content, prohibit use of electrically-powered equipment. Develops 4½-5-hp and can be operated from any standard compressor unit developing 90 lbs. of air pressure at approximately 90-95 cfm. Drills any size hole from 3 to 14" diameter. Cuts rapidly and efficiently in all sizes and in all materials such as reinforced concrete, granite, marble, brick, concrete

block, and quartz. Can be mounted on traverse arm of any standard drilling machine and swung through 360 degrees to drill in any position and at any angle. Weighs only 240 lbs. Can be handled easily by two men, column lifting out of base for moving between jobs.

Circle No. 155 on Reader Service Card

## Condensing Unit

**Product:** Addition to line of 5 and 7½-hp (shown) condensing units. Semihermetic line now includes ¼ through 7½ hp.

**Manufacturer:** Brunner Mfg. Co., Utica, N. Y.



**Features:** 5-hp units are four cylinder and may be cooled by air, water, or air-and-water. Semisealed 7½-hp units are six cylinder and water-cooled. Both models are available in Refrigerant 12 for high, commercial, or low temperature applications. Compact size provides less space requirements and allows greater flexibility in end product design. Light weight.

Circle No. 156 on Reader Service Card

## Hot Water Unit

**Product:** Add-on hot water dispenser for converting present pressure-type water coolers into combination, cold-hot water dispensers.

**Manufacturer:** McIntire Co., Livingston, N. J.

**Features:** Delivers up to 80 cups of hot water an hour at temperature of from 195-200 F. Easily added to back or side of any pressure-type water cooler in matter of minutes.

Uses only four screws and connection from present water supply line. Also utilizes existing basin and drain



facilities. Equipped with electrically controlled heater, adjustable thermostat, 6' of electrical cord and plug-in socket, and red nylon, push-button-type, goose-neck filler.

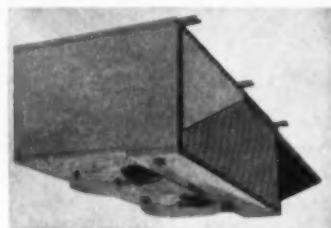
Circle No. 157 on Reader Service Card

## Heat Trap Coils

**Product:** "Defrostaire" heat trap coils.

**Manufacturer:** A. H. Witt Co., Los Angeles, Calif.

**Features:** Automatically defrost fresh meat rooms below 34 F, food storage, food freezing, ice cream storage, etc. Also suitable for low



temperature applications where temperatures vary from -20 to -85 F. Standard units are used with no special type of evaporator necessary. Heat trap system takes advantage of the fact that rising warm air can be trapped under hood and requires only low-cost, single-pole, double-throw time clock for complete automatic defrosting.

Circle No. 158 on Reader Service Card

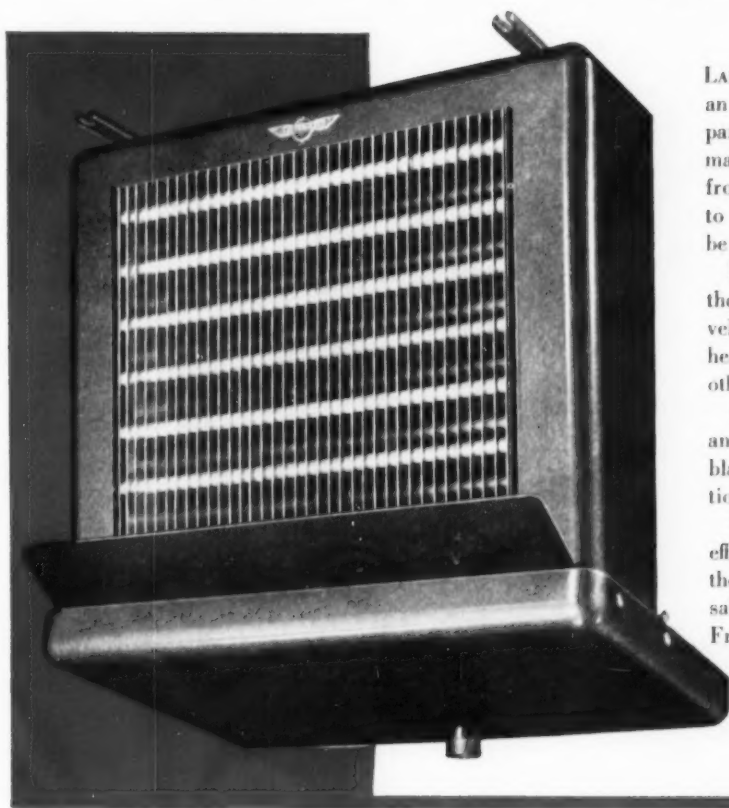
## Pipe Fitting

**Product:** Pipe fitting device which prevents refrigerant leaks at pipe connections.

**Manufacturer:** Tru-Seal Div., Flick-Reedy Corp., Melrose Park, Ill.

**Features:** Provides positive seal against Freon, sulphur dioxide, sulphur trioxide, and virtually all other gases and liquids, manufacturer says. Ideal for use at circuit joints and

# LARKIN PIONEERED THE USE OF US-KON® industrial heating blankets



LARKIN was first to recognize the need for an improved heating element in the drain pans of low-temperature units with automatic defrosting. Preventing drain pans from icing, and yet holding temperature rise to a minimum, was a problem that had to be solved.

Larkin engineers took their problem to the United States Rubber Company, developers of conductive rubber-imbedded heating elements for aircraft and many other heating applications.

U. S. Rubber engineers came up with the answer—the US-KON industrial heating blanket, especially designed for refrigeration applications.

This was the finishing touch to the most efficient, economical and trouble-free unit on the market. Get the facts from your wholesaler about the LARKIN Humi-Temp with Frost-o-Trol automatic hot gas defrosting.

**LARKIN LOW TEMPERATURE HUMI-TEMP**

WITH

**FROST-O-TROL®**

**AUTOMATIC HOT GAS DEFROSTER**

- US-KON heated drain pan for positive drainage of melting ice and water
- Minimum temperature rise during defrosting
- No excess heat or moisture load
- Lower operating costs
- Higher efficiency of evaporator unit
- Heat applied throughout entire evaporator
- Melts frost from inside out
- Simple, low-cost installation



**LARKIN COILS INC.**

519 MEMORIAL DRIVE, S.E., ATLANTA, GA.,—MURRAY 8-3171

at compressor inlets and outlets and expansion valves. Can be screwed on all current standard pipe threads



like ordinary nut. Does not need sealing compounds. Said to with-

stand burst pressures up to 10,000 psi and temperatures from -200 to 500 F. Sealing properties include circular insert of dry, milky-white, chemically inert plastic called "Teflon". In pipe sizes from 1/8 to 2 1/2". Reusable up to 50 times without replacement and simplifies alignment by permitting fitting to face any desired direction without distortion due to excessively high tightening torque for positioning. Able to stand repeated suction shocks, high impact shock loads.

Circle No. 159 on Reader Service Card

**BUY FROM YOUR  
REFRIGERATION WHOLESALER**

## Have you seen the deluxe model of the "Serviceman"?

See how much we have been able to improve this instrument that was so great from the start:—

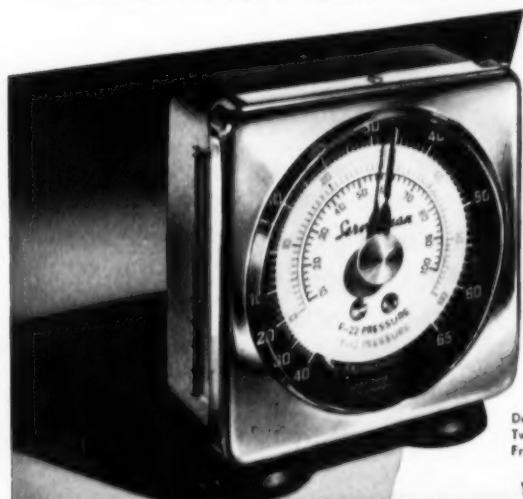
**Crystal now Polystyrene** . . . a lot stronger . . . far more scratch and stain resistant.

**Easier to reel up tubing** . . . bulb clip (see photo) changed to make reeling handy . . . spiral spring near bulb protects tubing from sharp bending.

**"Recalibrator"** screw right out in the open . . . on back of case for quick and easy access.

**Bourdon tube permanently leak tight** . . . you can't see this, but you'll find it out in use. An internal stop protects against excessive pressures.

If your faithful old "Serviceman" has earned retirement, why not replace it with the new 3-scale Deluxe type. Standard single-scale type (see photo) also available.



Standard model tests to 40 below.



Note protected tubing; handy bulb clip; accessible "Recalibrator" screw.

Deluxe 3-scale tests to 40 below  
Two added color scales show  
Fren -12 and -22 pressures.

Your Jobber Stocks Them

# MARSH Refrigeration Instruments

MARSH INSTRUMENT CO. Sales Affiliate of Eas. P. Marsh Corp.,  
Dept. P, Skokie, Ill. Marsh Instrument and Valve Co.  
(Canada) Ltd. 8407 103rd St., Edmonton, Alberta  
Houston Branch Plant: 1121 Rothwell St., Sect. 15, Houston, Texas

GAUGES • WATER REGULATING VALVES • SOLENOID VALVES • HEATING SPECIALTIES

Circle No. 49 on Reader Service Card

### Installation Kit

**Product:** Residential air conditioning installation and service tool kit.

**Manufacturer:** Imperial Brass Mfg. Co., Chicago, Ill.

**Features:** Fits needs of most installation requirements. Steel tool



box free with tool set. Designed for working all size tubing from 1/8 to 3/4" OD. Includes tube cutter with spare cutting wheel, flaring tool, tube benders, full set of swagging tools, and tube reamers. Double gauge charging and testing unit, and two charging hoses. Revision of set made upon request. Tool box has two cantilevered trays, which let all tools immediately be visible when box is opened. Snap lock with keys assures tool protection. Twelve dividers for trays. Overall weight is 34 1/2 lbs. Size is 21 x 7 1/2 x 7 1/4".

Circle No. 160 on Reader Service Card

### "Pass-Thru" Refrigerator

**Product:** Complete line of "Pass-Thru" refrigerators (model HR75-10-U shown).



**Manufacturer:** Foster Refrigerator Corp., Hudson, N.Y.

**Features:** Nine self-contained models from 15 to 95 cu.ft. Six remote models from 21 to 100 cu.ft.

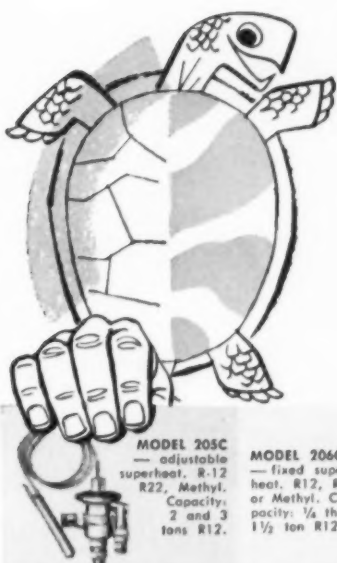
Circle No. 161 on Reader Service Card

### Time Switch

**Product:** Tungsten-rated time switches for handling heavy-duty incandescent lighting loads.

**Manufacturer:** International Register Co., Chicago, Ill.

**Features:** Carry momentary inrush surge of more than eight times their normal amperage rating, manufacturer says. Designed to counteract contact welding. In-



# You're Covered Completely

because A-P keeps an eye on everything  
that goes on in the  
refrigeration industry!



**MODEL 205C** — adjustable superheat. R-12, R22, Methyl. Capacity: 2 and 3 tons R12.

**MODEL 206C** — fixed superheat. R12, R22 or Methyl. Capacity: 1/4 thru 1 1/2 ton R12.

**MODEL 207C and 207D** — adjustable superheat. Internally equalized. Small size — easy to install. Capacity: 1/4 thru 3 ton R12; 1/4 thru 5 ton R22; 1/2, 1, and 2 ton Methyl Chloride.

**MODEL 309** — adjustable pressure limit and superheat. R12, R22 or Methyl. 1/4, 1/2, 1, 1 1/2 tons R12.

## THERMOSTATIC EXPANSION VALVES

**MODEL 214** — adjustable superheat 1, 2, 3 tons R12, R22, Std. or M.O.P. charges.

**MODEL 217** — adjustable superheat. Solder connections. 5 to 12.5 tons R12; 7 1/2 to 19 tons R22. Std. or M.O.P. charges.

**MODEL 218** — adjustable superheat. R12 (16, 19, 25 tons), R22 (25, 30, 40 tons), Std. or pressure limiting charges.

**MODEL 104D** — open-type adjustment. Solder connections. R12, R22, Methyl and Sulphur. Capacity: 1/2 ton R12.

**MODEL 204C** — with graduated pressure scale. R12, R22, Methyl or Sulphur. Capacity: 1/2 ton R12.

## THERMOSTATIC EXPANSION VALVES

## AUTOMATIC EXPANSION VALVES

**MODEL 304C** — R12, R22, Methyl and Sulphur. Capacity: 1 ton R12.

**MODEL 408** — Trap-It. 3 sizes. Connections 1/4 to 3/8" SAE.

**MODEL 410** — Trap-Dri. 3 sizes. Connections 1/4 to 3/8" SAE, 1/2 O.D. to 1 1/8" O.D. Solder.

**MODEL 238** — evaporator pressure regulator. All non-corrosive refrigerants. Capacity: 1 ton R12.

**MODEL 235S** — evaporator pressure regulator. R12, R22, Methyl & Sulphur. 2 adjustment ranges.

## AUTO. EXPANSION

## FILTERS and DRIERS

## REGULATING VALVES

**MODEL 239** — Pressure regulator. Two adj. ranges: 40-140 and 80-210 psig. All non-corrosive refrigerants.

**MODEL 237** — crankcase pressure regulator. Adjustable 0-40 psi. 2 cap. ranges. 1 1/2 & 3 tons nom. R12.

**MODEL 65** — for all non-corrosive refrigerants. Sizes: 1/8, 1/2 and 3/4" female N.P.T. sliding seat (65 to 200 psi, 165 to 300 psi ranges); 1 and 1 1/2" double ceramic seat (70 to 170 psi, 160 to 240 psi ranges).

**MODEL 73** — multi-purpose. Three orifice sizes, four body styles.

**MODEL 67** — sweat or pipe tap connections. All-purpose. Soft, or metal-to-metal seat.

## REGULATING VALVES

## SOLENOID VALVES

**MODEL 270** — refrigerant. Suitable for hot-gas defrost. 3/8 or 1/2" orifice.

**MODEL 70NAX** — refrigerant. Pilot operated, 9/16" orifice.

**MODEL 70N** — refrigerant. Large capacity. Pilot operated, 1" orifice.

**FLARE TYPE** — 1/2 or 3/4" flare-nut. 1/2, 1, 1 1/2, 2 and 3 tons capacity, R12. Up to 6 — 1/4" O.D. outlets.

**SOLDER TYPE** — for Models 214E, 216CE, and 217E and 218E TXV's and gen. service. 1/2" O.D. thru 1 1/4" O.D. Any number and size of outlets. Capacity thru 40 tons, R12.

## SOLENOID VALVES

## DISTRIBUTORS

## CONTROLS COMPANY OF AMERICA



Manufacturers of **A-P CONTROLS**

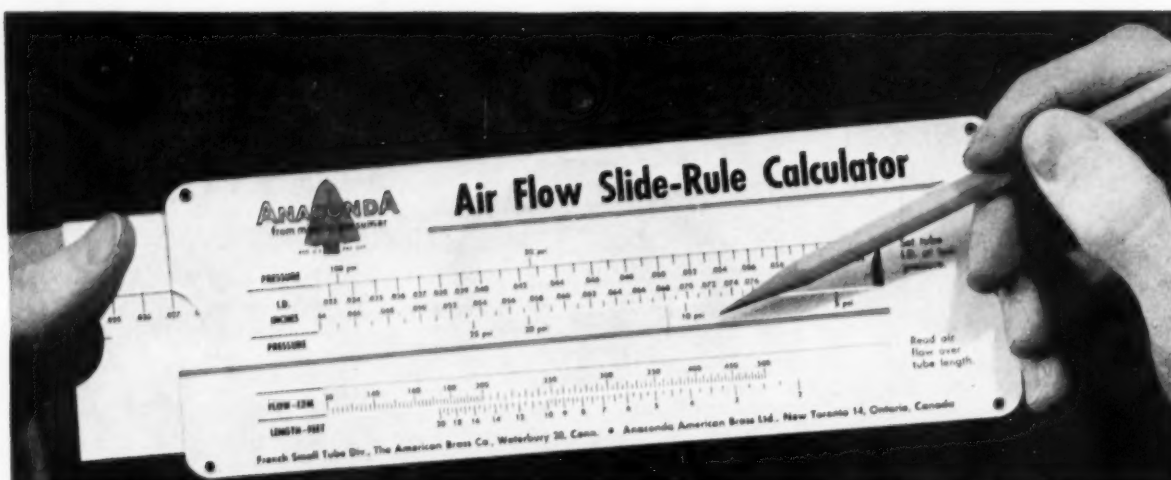
2486 N. 32nd Street, Milwaukee 45, Wis.

Controls That Make Modern Living Possible



If you don't see what you want here, ask your jobber — or write for latest, complete line catalog... NOW.





## NOW for the first time—an easy way to determine air flow

### New Anaconda Calculator eliminates time-consuming cut-and-try method

This new slide rule was developed for engineers designing air conditioning and refrigeration equipment. The calculations, now so easy to make, are based on thousands of tests made in the laboratory and under actual production conditions over a period of many years.

**Specialists in Tubing.** The French Small Tube Division of The American Brass Company drew its first restrictor tubes back in the 1920's when hermetic refrigeration units were being developed. Ever since, it has worked closely with the refrigeration and air-conditioning industries, was one of the pioneers in helping to determine air-flow limits, and now has a broad basis of experience which is available to help you.

When you use Anaconda Restrictor Tubes you are not limited to so-called standard inside diameters. You specify the air-flow limits you need for maximum performance in your equipment—

—or simply submit samples of tube which have the desired limits of air flow. From these samples, we can readily determine the required nominal inside diameter and the over-all tolerance for any given length to possess a flow capacity within the range of these samples. An optimum tube size may meet your requirements and show a saving in cost.

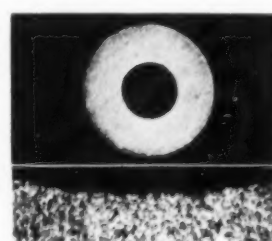
**Performance measures true quality.** Specific, mutually agreed on air-flow limits are the sole basis for production. Your initial shipment will contain Master Sample Reference Tubes, which have the maximum and minimum flow capacities required. All tubes in the shipment will have been tested to meet these limits.

Duplicate Master Reference Samples retained in our files are the means of making certain that every tube in all subsequent shipments will have the air-flow limits established.

**Consistently high quality.** All Anaconda Restrictor Tubes are plug-drawn to finish. Unusual care is exercised in making the steel plugs, in order to produce a smooth, round inside bore as shown in the cross-section micrographs below. Every length is chamfered at both ends, inside and out. Each tube is thoroughly washed and dried, given a final test, carefully bundled, with ends of each bundle wrapped in paper. Your range of selection is broad, as Anaconda Custom-Made Restrictor Tubes are made in both copper and aluminum, in nominal inside diameters from .025 inches to .090 inches.

Write today on your company letterhead for the free Anaconda Air-Flow Slide Rule Calculator shown above. Address: French Small Tube Division, The American Brass Company, Box 1031, Waterbury 20, Conn.

A cross-section of an Anaconda Copper Restrictor Tube, .081" O.D. x .031" I.D., magnified 10X. Note the roundness of the bore.

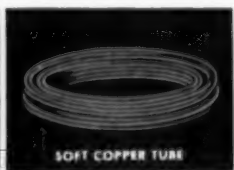


Section of a photomicrograph magnified 200X to show smoothness of the bore.

## ANACONDA<sup>®</sup> RESTRICTOR TUBES

Made by French Small Tube Division of The American Brass Company

ANACONDA PRODUCTS FOR THE REFRIGERATION AND AIR-CONDITIONING INDUSTRY

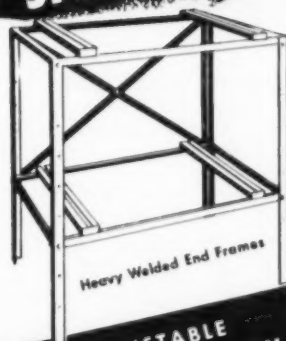


Circle No. 51 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

**NEW**

**IMPROVED  
SPACE SAVER**



Heavy Welded End Frames

**ADJUSTABLE  
COMPRESSOR RACK**

- Saves Valuable Storage Space
- Saves Installation Time
- More Economical than Home-Made Racks
- Raises Units off floor — for easier servicing for flood protection for easier cleaning
- Fire Hazard Protection — all metal construction
- Improves Installation appearance

THE SPACE SAVER offers a sturdy, dependable rack, quickly and easily installed. Packaged in heavy storage carton. Requires very little storage space. Assembled in a few minutes.

Design-Engineered for  
Rugged Service



**RAPID DUZ-ALL**  
Carbonic Gas Service Cylinder — The Service Man's Quickset, Easiest, & most satisfactory way to clean condensers. It's a money-maker. Write for Details.

SEE YOUR WHOLESALE

Write for new Catalog  
No. 456

**FINE PRODUCTS CO.**  
6240 OGDEN AVE.  
BERWYN (Chicago Sub.) ILLINOIS

Circle No. 52 on Reader Service Card  
& AIR CONDITIONING • JULY, 1957

creased capacity for lighting loads made possible with tungsten rating. Models include standard on-off, switch, Skipper, and short interval



(5 to 60 minute) switches. Increased contact surface and self-cleaning design. Composition said to be immune to pitting, arcing, and sticking. Spring brassy U-beam blades, channeled for greater rigidity, eliminate blade bounce and give more positive make and break action. Hi-power switching mechanism produces greater switching power.

Circle No. 162 on Reader Service Card

#### Solenoid Valve

**Product:** Type 20, addition to line of solenoid valves.

**Manufacturer:** Sporlan Valve Co., St. Louis, Mo.

**Features:** Nominal rating of five tons (Refrigerant 12) thus providing intermediate valve for capacity range between those of manufacturer's Types 12 and 73. Maximum opening pressure differential of 275 psi. Can be used in both Refrigerants 12 and 22. Has 5/16" orifice with 5/8" ODF connections on inlet and outlet. Powered by "Blue Seal" coil in all standard voltages including dual voltage (AC) and direct current up to and including 115 volts.

Circle No. 163 on Reader Service Card

#### Utility Truck Body

**Product:** Utility truck bodies especially designed for air condi-



tioning and refrigeration contractors and service firms.

**Manufacturer:** Reading Body

#### ● FULL FLOW

#### \* SELF ADJUSTING

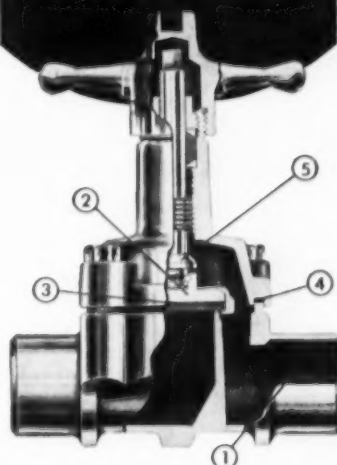
#### ● POSITIVE SHUT-OFF

#### \* LEAK-LOK BONNET SEAL

#### ● REPACKS IN USE

#### \* TEMPERATURE PROOF

**KEROTEST  
PACKED  
GLOBE  
VALVES**



"Packed" with quality and of rugged brass construction, these valves are ideal for refrigeration and air conditioning systems, oxygen (degreased), nitrogen, compressed air and liquified petroleum gases. Features: 1. Designed for full flow. 2. Floating disc for self-adjustment. 3. Quick seating disc for ease of operation. 4. Leak-proof with exclusive gasketing. 5. Repacks under pressure with positive back seating. Maximum operating pressure 500 p.s.i.—maximum temperature 200° F. See your Kerotest wholesaler.

R12 Series 1/4"-2 1/8" Forged Brass  
R10 Series 2 1/4"-4 1/4" Cast Brass

**KEROTEST**

**KEROTEST MANUFACTURING CO.**  
2504 Liberty Avenue  
Pittsburgh 22, Pa.

Circle No. 53 on Reader Service Card

Works, Inc., Reading, Pa.

**Features:** Available models include utility and panel bodies with canopy tops, in chassis sizes from 1/2 to 1 1/2 tons. Constructed of heavy gauge steel welded into one integral unit. Watertight doors. Reinforced tailboards. Complete undercoating. Variable compartment and shelving arrangements provide large storage and load areas.

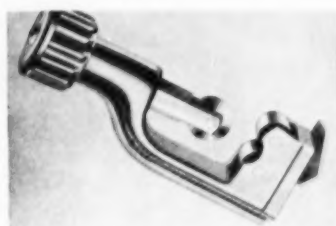
Circle No. 164 on Reader Service Card

#### Tubing Cutter

**Product:** "Pipemaster" 1-T tubing cutter for nonferrous and plastic

tubing and thin wall conduit.

**Manufacturer:** Erie Tool Works, Erie, Pa.



**Features:** Range of operation is 1/8" to 1 1/8" OD. All cuts are straight and smooth without distorting tubing

out of round, and will operate with minimum effort, manufacturer says. Screw mechanism enclosed in precision-made casting for clean and faster adjusting. Safety-pivoted reamer swings back out of way when not in use. Weighs only 10 oz. Overall length 4 1/2".

Circle No. 165 on Reader Service Card

#### Induced Draft Cooler

**Product:** Induced draft, horizontal air discharge fluid cooler.

**Manufacturer:** Trane Co., La-Crosse, Wis.

**Features:** Available in nine sizes with capacity range of from one

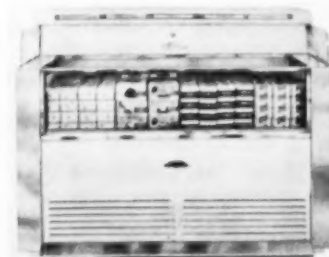


million to 10 million Btuh. Consists of one or more extended surface heat transfer coils with mechanical fin-to-tube bond; propeller fan with drive; and steel support structure. Automatic or manually controlled pitch fan. Vibration-free operation. Motor and fan-drive installation. Outside hot air discharge, in safe, accessible waist level location for complete ease of maintenance. Controllable pitch fan provides for precise method of controlling variable flow of air to maintain predetermined temperatures.

Circle No. 166 on Reader Service Card

#### Merchandising Case

**Product:** Merchandising case (Model 630 sub-zero) for packaged



ice cream or frozen foods.

**Manufacturer:** Fischman Co., Philadelphia, Pa.

**Features:** White baked enamel with stainless steel trim. Full-visibility

## COMPARISONS PROVE



Part No. CV-1

**CONTROL VALVE**  
A lifetime tool designed expressly for WatSCO Line Tap, Can Tap and Line Port Valves.

### WATSCO'S LINE TAP VALVES ARE YOUR BEST BUY...

These compact, easily installed valves make handy, inexpensive ports for charging, discharging and testing hermetically sealed units.

### 10 REASONS WHY

WATSCO LINE TAP VALVES ARE RIGHT FOR EVERY JOB!

|                                      | WATSCO | Valve A | Valve B | Valve C |
|--------------------------------------|--------|---------|---------|---------|
| 1. Protection and sealing cap        | yes    | no      | no      | no      |
| 2. Conforms to exact tube size       | yes    | no      | no      | no      |
| 3. Tamper proof                      | yes    | no      | no      | no      |
| 4. Sizes range from 3/16" to 5/8"    | yes    | no      | no      | no      |
| 5. Distorts or crimps tubing         | no     | yes     | yes     | yes     |
| 6. Top heavy assembly                | no     | yes     | yes     | yes     |
| 7. Requires minimum space. (max. 1") | yes    | no      | no      | no      |
| 8. 3 Point sealing.                  | yes    | no      | no      | no      |
| 9. Replaceable piercing needle       | yes    | no      | no      | no      |
| 10. ALL SIZES SAME PRICE             | yes    | no      | no      | no      |

U.S. PATENT APPLIED FOR



INC.

Send for 1957 Catalog

1020 EAST 15th STREET, HIALEAH, FLORIDA.

Circle No. 54 on Reader Service Card

ity, show-window display. Flood lighting from super-structure. Full  $\frac{3}{4}$ -hp HD compressor with positive temperature controls and automatic quick defrost system. Capacity approximately 13 cu. ft. (approximately 700 Philadelphia pints) storage capacity. Dimensions overall 70" long x 31 $\frac{1}{2}$ " wide x 42" high.

Circle No. 167 on Reader Service Card

#### Base For Compressor

**Product:** Heavy-gauge welded base with storage shelf for use with hermetic compressor opener.



**Manufacturer:** Frankell Mfg. Co.

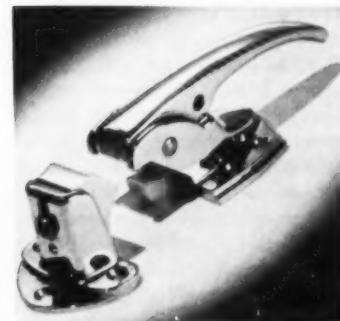
**Features:** Base insures positive stability for opener when it is in use. Eliminates need of using valuable table or bench space for it. Compressor opener opens any shape compressor up to 20" in diameter regardless of location of weld.

Circle No. 168 on Reader Service Card

#### Refrigerator Lock

**Product:** All-nylon bolt lock for refrigerator doors.

**Manufacturer:** Grand Rapids



Brass Co., Grand Rapids, Mich.

**Features:** Lubricated action makes doors smoother and easier to open and close. Nonconductor of heat or cold. Grip design. Copper-nickel-chrome finish. Ease of mounting.

Circle No. 169 on Reader Service Card

#### Case Temperature Dial

**Product:** "Flexicold" temperature selection dial added to line of



8' refrigerated food display cases.

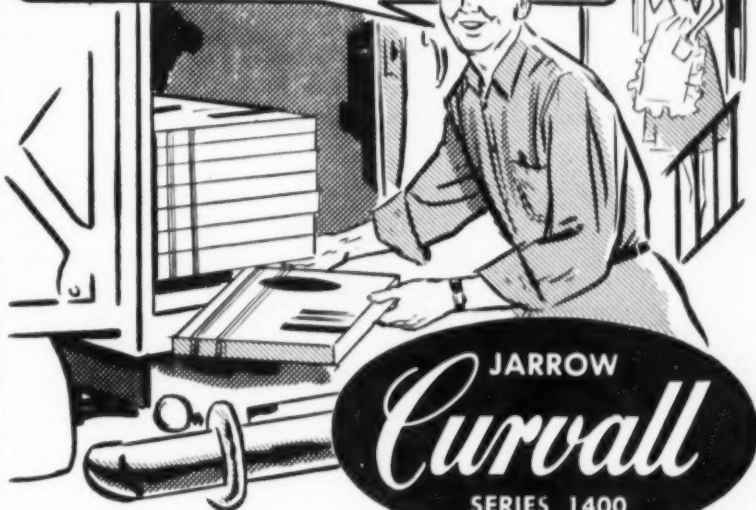
**Manufacturer:** Sherer-Gillett Co., Marshall, Mich.

**Features:** Temperatures can be set ranging from -5 to +44 degrees

with twist of dial in both wall frozen food and ice cream merchandiser and island unit (shown). Cases contain accessible hermetic refrigeration unit actuated by temperature control. Automatic defrost and self-evaporating. Hermetically-sealed cabinet with heavy fiber glass insulation. "Sheralon" finish and anodized aluminum trim. Color bands available in yellow, green, coral and blue. Can be ordered with entire front panel in white. Capacity 19.7 cu.ft.; 21.1 sq.ft. of shelf area. Enough room for seven frozen food packages from front to back — total of 1,080.

Circle No. 170 on Reader Service Card

"Yes ma'am — got the right gasket right here!"



JARROW  
*Curvall*  
SERIES 1400

FOR REFRIGERATOR AND  
FREEZER DOORS



"Since I started carrying all 11 sizes of "Curvall" gaskets with me, I complete most every job *on the spot*. You see, these 11 "Curvall" sizes fit practically every refrigerator and freezer door on the market.

"Besides not having to waste time going back to my wholesaler for the right gasket, "Curvall" takes much less time to install because it eliminates notching on the rounded corners and fits perfectly on the door straight sections as well . . . and with me, *time is money!*"

Your wholesaler will give you the green "Curvall" installation guide. Also ask him for the Jarro Pocket Gasket Selector and new Catalog C-300.



Circle No. 55 on Reader Service Card

## "HIGHSIDE" NAME BACK IN COOLING FIELD

As of June 1, the business conducted by Stewart Industries, Inc., formerly Highside Chemicals Co., was purchased by a new corporation known as Highside Chemicals Incorporated.

It is presently contemplated that the business will continue to be conducted from the same address and by the same personnel. Addition of Albert R. Shelby to the organization as secretary-treasurer is

planned. Headquarters of the company are at 10 Colfax Ave., Clifton, N.J.

## WOLVERINE BUILDS NEW ADMINISTRATIVE OFFICE

Wolverine Tube Div. of Calumet & Hecla, Inc., has begun construction of a new administrative office in Allen Park, a Detroit suburb. A one-story modern building with a brick, glass and vitreous covered steel exterior, the 24,000 sq. ft. structure will be housed

on an 8-acre wooded site. An additional 7,000 sq. ft. building will be erected to house research and development activities.

When the new buildings are completed in 1958, 150 headquarters and general sales office employees will move from two offices in downtown Detroit to the new facilities.

## H. F. SPOEHRER ELECTED PRESIDENT OF ASRE

H. F. Spoehrer, vice president and treasurer of Sporlan Valve Co., was elected president of American Society of Refrigerating Engineers at the 53rd annual meeting of the society in Miami.

Cecil Boling, president of Dunham-Bush, Inc., was elected first vice president; D. D. Wile, vice president of Recold Corp., was named second vice president; and George K. Iwashita, formerly general manager of the Air Conditioning Div. of General Electric Co., was elected treasurer.

New directors include: Carl R. Fagerstrom, chief draftsman, Niagara Blower Co.; Ralph A. Gonzalez, staff assistant to the vice president in charge of sales, Airtemp Div., Chrysler Corp.; James W. Snyder, Snyder Equipment Co., and Robert H. Tull, manager of room air conditioner engineering, Westinghouse Electric Corp.

## REMINGTON HOLDS SALES CONFERENCE

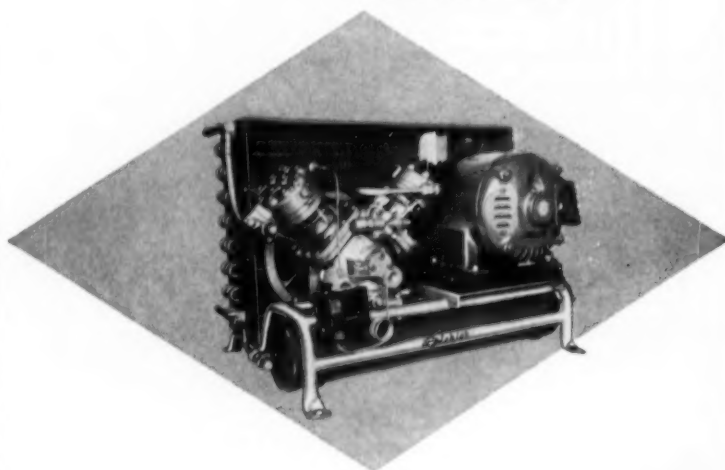
Remington Corp.'s incremental system of air conditioning for multi-room buildings is now installed, or about to be installed, in some 80 office buildings, apartment houses, hotels, motels and hospitals, president Herbert L. Laube reported at a recent two-day conference of sales representatives at the company's Auburn, N.Y. plant.

Representatives from Boston, New York City, Albany, Syracuse, Philadelphia, Richmond, Greensboro, Atlanta, Nashville, Pittsburgh, Cincinnati, Cleveland, Detroit, Chicago, St. Louis, Des Moines, Omaha and Wichita attended the conference. It was announced that for the time being, marketing of the new system will be limited largely to areas covered by the present organization.

## LEHIGH **BLU-COLD** CONDENSING UNITS

lead in

**ADAPT**-ability  
**DEPEND**-ability  
**FLEX**-ability  
**SERVICE**-ability



—and their unique tubular air-frame base adds complete ACCESS-ability!

where "ability" counts, specify Lehigh



write now . . . for important,  
informative catalog

**LEHIGH MANUFACTURING CO. • DIVISION OF LEHIGH, INC.**

Plant: Lancaster, Pa.

Export Dept.: 13 E. 40th St., New York, N. Y.



Circle No. 56 on Reader Service Card

## GIVE 'EM AIR . . .

*Continued from page 49*

using a 1½-hp unit.

To save space, Davison planned for the erection of two separate machinery rooms, one on top of the produce cooler and one on top of the meat cooler. These rooms, each 7' in height, were built up as simply as possible out of wooden framing and insulating board.

Fourteen of the air cooled condensing units were located in one of these machinery rooms, and the remaining 14 in the other. The units were double-decked on simple wooden frames. Wooden compressor racks, rather than ones made of steel or angle iron, were used because they cost less, were lighter, and could be tailored more readily to fit the existing space. Because of the isolated location of these equipment rooms, appearance was no factor.

### Cooler Was Reinforced

All of the walk-in coolers are standard factory-produced sectional units. To help support the weight of the 14 condensing units on top of the produce cooler, the ceiling of this cooler was braced internally with a framework of I-beams. No such additional support was required to bear the weight of the units atop the meat cooler, as the ceiling of that cooler already had been reinforced to support the weight of fully loaded meat tracks.

Each of the two equipment rooms erected over the coolers actually was divided into two sections. In the larger of the two areas, the 14 condensing units were mounted as previously indicated, together with a powerful exhaust fan. The smaller area was designed to serve as a plenum for intake air for the room's ventilating system.

Between the two sections, a full partition was erected. Openings were cut in this partition to match the location of each of the 14 condenser coils. These openings were closely fitted to the size of each coil, and then "weatherstripped" around the edges. Thus, all air moving from the plenum chamber to the machinery room is forced to pass across the condenser coils.

Actually, because the produce cooler was located against a side wall of the market building while the meat cooler was adjacent to no exterior walls, it was necessary to handle the ventilating of the two equipment rooms in a somewhat different manner, although the basic principle of operation remained the same.

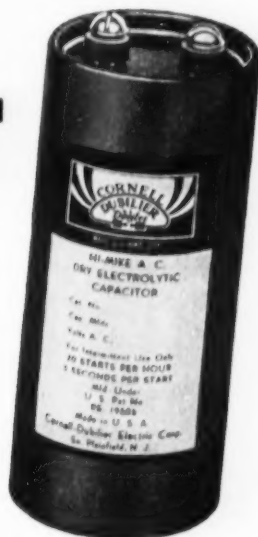
In the case of the room over the meat cooler, a hooded fresh air intake was installed through the roof. This intake leads down into an enclosed filter bank inside the plen-

um section of the equipment room. Mounted in this filter cabinet are six 30 x 30" cleanable filters. After passing through this filter bank into the plenum, the air is drawn through the condenser openings into the machinery room, and then down a long sheet metal duct leading to the rear wall of the building where it is exhausted by a 43", 30,000 cfm fan mounted at that spot.

Because one wall of the equipment room over the produce cooler also is an exterior wall of the

With motor manufacturers C-D Motor Capacitors are first by far. With motor, refrigerator, air conditioning, oil burner and household appliance maintenance servicemen, C-D capacitors are first choice. You can be sure of C-D's outstanding field performance record and ease of installation. This, plus C-D's great range of types makes it the preferred line among men of experience. That's why Distributors who know, carry the complete Cornell-Dubilier line.

WANT THE  
**BEST**  
IN MOTOR  
CAPACITORS?  
**C-D**  
TO BE SURE!



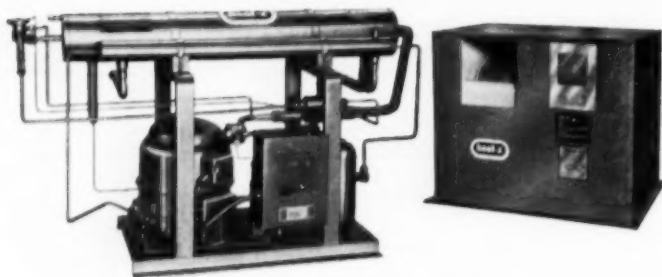
Always insist on C-D — there's a right type for every motor. Ask your C-D distributor for your free copy of C-D's famous motor capacitor Manual and Catalog No. 163. He's listed in your classified 'phone book. Cornell-Dubilier Electric Corporation, Dept. CR-116 South Plainfield, New Jersey.



CONSISTENTLY DEPENDABLE  
**CORNELL-DUBILIER CAPACITORS**

PLANTS IN SOUTH PLAINFIELD, N. J.; NEW BEDFORD, WORCESTER AND CAMBRIDGE, MASS.; PROVIDENCE AND HOPE VALLEY, R. I.; INDIANAPOLIS, IND.; SANFORD AND PUGUAY SPRINGS, N. C.; SUBSIDIARY: THE RADIANT CORPORATION, CLEVELAND, O.  
THERE ARE MORE C-D CAPACITORS IN USE TODAY THAN ANY OTHER MAKE

## BOOM FORECAST in RESIDENTIAL AIR CONDITIONING



Assure YOUR Profit Share  
with these NEW **heat-x** Units

Completely packaged water chillers... in 2, 3 and 5 HP models... designed for easy, speedy installation that *builds profits*. Available in water-cooled models ('RPC') and air-cooled models ('ARPC'), these new Heat-X units were developed specifically for residential and light commercial air conditioning systems.

High efficiency patented Inner-Fin® construction of chillers, superheaters and condensers makes these the most compact units on the market. All water passages are of non-ferrous construction, eliminating corrosion problems.

Don't be left behind in the coming residential air conditioning boom. Write today for complete data on 'RPC' and 'ARPC' units.



Circle No. 58 on Reader Service Card

market building, it was not necessary to utilize any exhaust duct. The 30,000 cfm fan is mounted right in the wall of the machinery section of this room, and the hot air from the condensers is exhausted directly to the outside.

In this instance the fresh air intake, instead of being located on the roof, actually is placed in the same exterior wall as the exhaust fan. Air is drawn in through the adjacent filter cabinet, which houses six 24 x 30" cleanable filters, and then directed up over the bar joist into the plenum section of the room. From that point it is



drawn through the condenser openings into the machinery section and out through the exhaust fan.

The exhaust fans for both machinery rooms are thermostatically controlled to cut in whenever temperature in the machinery room reaches 85 F. They continue to operate until the temperature again drops below that point. Louvers on the fan openings are automatically controlled by the air pressure so that they are forced open when the fans commence to operate and close for protection against the elements whenever the fans cut out.

Manual fan cut-off switches are mounted on the exterior of each room so that the access doors, which hinge outward, can be opened readily by maintenance personnel, without having to force them against the exhaust air pressure while the fans are in operation.

While Davison himself developed the original plans for this installation, and promoted the use of this type of system to the mar-



Arden's Zero Storage Plant at Fresno, California

## No ice formation on Styrofoam<sup>®</sup> insulation in seven years of use by Arden Farms


Styrofoam, a Dow plastic foam insulation, was first installed by Arden Farms in its Portland, Oregon, ice cream plant in 1950. Since then, Styrofoam has been used in other ice cream plants and a cold storage plant.

"We feel we can use Styrofoam without fear of the insulation becoming ice laden over a period of time," says C. H. Stevenson, Chief Engineer at Arden. "The material eliminates a

great deal of expense in framing the ceiling of our cold storage rooms in that it is very light weight and will not build up with ice. Styrofoam has good insulating qualities and will retain them throughout the entire period of use."

For specific information about Styrofoam and its many outstanding advantages, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Department PL1702A.

### CHECK THIS EXCLUSIVE COMBINATION OF PROPERTIES

|  | Insulations | Low "R" factor | Superior water resistance | High compressive strength | Light weight | Superior resistance to rot and vermin | Easy handling and fabrication | Low-cost installation | Lowest cost per year service |
|--|-------------|----------------|---------------------------|---------------------------|--------------|---------------------------------------|-------------------------------|-----------------------|------------------------------|
|  | STYROFOAM   | •              | •                         | •                         | •            | •                                     | •                             | •                     | •                            |
|  | A           | •              | •                         | •                         | •            | •                                     | •                             | •                     | •                            |
|  | B           | •              | •                         | •                         | •            | •                                     | •                             | •                     | •                            |
|  | C           | •              | •                         | •                         | •            | •                                     | •                             | •                     | •                            |

YOU CAN DEPEND ON





## HIGHEST VALUE AT LOWEST COST

**FREE SWIVELING**—will not kink hose while tightening.

**FINGER-GRIP**—precision machined knurled nut for easier handling.

**ALL BRASS** barb and ferrule for positive seal.

**TUBULAR GASKET**—impervious to common refrigerants. Won't pop out.

**1/4" SAE FLARE CONNECTION**

Specify Madden to your Wholesaler



**MADDEN BRASS** PRODUCTS COMPANY  
AURORA 2, ILLINOIS, U.S.A.  
EXPORT: Ad Aurum 55 Broad St., New York, N. Y.

ket owners, actual supervision of the installation was directed by Tom Archambeau, service manager of the Davison organization.

Davison freely admits that the idea for this method of providing adequate ventilation for air cooled condensers located in remote machinery rooms did not originate with him. He merely adapted to his own use a similar idea that he had first seen on one of his trips to Texas. If it would work in Texas, he reasoned, why wouldn't it work in Toledo? So he determined to try it.

There's really not much of a trick to it, he modestly points out. Really the only question that concerned him was the amount of air to be handled. So he figured out what air volume should be required, and then added 25% as a safety factor. The fans actually were sized on the basis of 1000 cfm per ton of refrigeration, but since the job has been placed in operation Davison has had reason to believe that the system would have operated just as satisfactorily with somewhat smaller fans.

Davison reports that he encountered little opposition in selling this idea to the management of Oscar Joseph Stores. While initial cost of this air cooled installation proved to be approximately the same as that of a comparable installation using water cooled condensing units in conjunction with a cooling tower, Davison estimates that the maintenance costs of the air cooled system will be about 25% less. This is the primary point that he stressed to the store management, and naturally it was a point which had strong appeal.

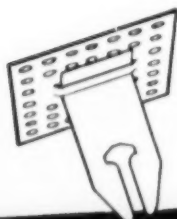
A secondary talking point was the saving in space that could be effected by locating the condensing units on top of the coolers. But now that the installation is in operation, Davison admits that he feels a separate ground level machinery room, ventilated in the same manner, actually would be more desirable. Not only would it eliminate the need for structurally strengthening the coolers, but it also would make the equipment more accessible for service when required.

## INSULATION INSTALLATIONS

FASTER — EASIER — COST LESS!

Anchors by

# Stic-Klips®



Stic-Klips® are time and labor saving anchors and fasteners for attaching insulation, strapping, metal lath, wall fixtures, wiring and conduit to curved or flat metal or masonry surfaces. Stic-Klips® feature no surface drilling, quick fastening, no fire hazard and a strong positive bond.

Send for free illustrated folder.

# Stic-Klip®

MANUFACTURING  
COMPANY, INC.

54 Regent Street • Cambridge 40, Massachusetts

## Instruments for Measuring AIR TEMPERATURE and VELOCITY

### TEMPSCRIBE Recording Thermometer

Available in 10 different ranges to cover -30°F to +100°F temperatures, and with spring-operated chart drives for any of the following chart rotations: 6 hours, 24 hours or 7 days.

This entirely self-contained, compact and reliable temperature recorder automatically writes a continuous record of temperature changes on a replaceable chart. Record shows at a glance maximum and minimum temperatures and the duration of temperatures above or below any given point; also shows the exact time of every temperature change and how rapidly it takes place. Recording pen and bi-metallic element are built in hinged, removable door which is also front of instrument. Thus, by merely changing doors it is easy to interchange temperature ranges. Instrument is 8" tall, 5 1/2" wide and 4 1/2" deep. Charts are 4 1/2 inches in diameter.



Write for Bulletin I-715

### FLORITE Anemometer

In principle, this unique instrument operates as an anemometer but provides instantaneous, direct readings of air velocity without timing, calculations or reference to charts. Readings are obtained by holding the instrument in the air stream so that air blows against its circular face, causing rotation of a multi-blade rotor mounted in instrument housing. The circular scale surrounding the rotor instantly turns to correct air velocity reading under index pointer on scale window. Furnished with detachable handle (not shown) and leather case.



Available in two styles: One with a scale of 0-1000 ft./min., and the other with a scale of 0-3000 ft./min.

Write for Bulletin I-760

## BACHARACH Industrial Instrument Co.

200 N. BRADDOCK AVE.

PITTSBURGH 8, PA.

Circle No. 60 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

# DEALERS! Here's new profit for you!

## A SCOTSMAN DRINK DISPENSER

### that makes its own ice!

**ANOTHER  
SCOTSMAN  
FIRST!**

Models for  
350 or 550 lbs.  
of Ice Daily!

Big Counter  
and Drain  
Space!



Handy Waist  
High Ice  
Opening!

Built-In  
Brand Name  
Carbonator!

Storage Room  
for bulk syrup,  
cups, straws!

Any  
Combination  
of Dispensing  
Heads!

**BE FIRST TO PROFIT** from this exclusive Scotsman unit! It's the combination drink dispenser and ice machine that fits any customer's need!

**SELL YOUR BIG CUSTOMER!** Sell your small accounts! Put in a single unit or arrange in multiple banks!

Install at either front or back counter. Simple to use . . . ideal for young, inexperienced help.

**GET ON THE PROFIT BANDWAGON** with Scotsman! Send for complete details on the exclusive Scotsman drink dispenser that makes its own ice!

**AMERICA'S MOST SPECIFIED LINE OF ICE MACHINES!**

**SCOTSMAN**

*Super  
Cubers*



*Super Flakers*



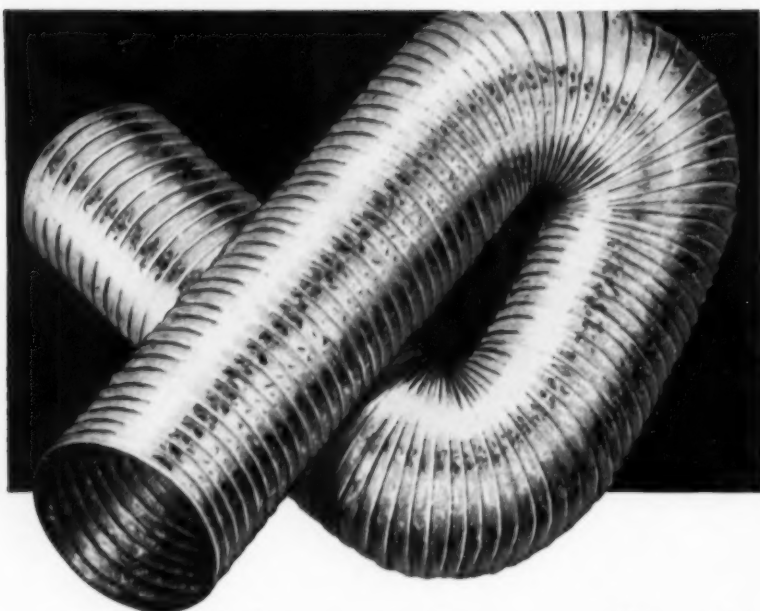
*Yes—* Rush new literature and complete details on the Scotsman combination ice machine and drink dispenser!

NAME \_\_\_\_\_

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CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

Mail to: American Gas Machine Co., Division of Queen Stove Works, Inc.  
197 Front Street, Albert Lea, Minnesota



## facts about Thermaflex®

that will help you solve  
your ducting problems

### What is Thermaflex?

A lightweight, flexible ducting made of a spring steel wire helix covered with a three-ply reinforced laminate of woven fiber glass and metallic sheeting.

### What are its applications?

Thermaflex is designed to supply air at temperatures ranging from 0°F. to 250°F. It is mainly used as a connector between main lines and diffusers or sound boxes in heating and air-conditioning systems.

### What about installation?

It installs faster than rigid ducting at savings up to 32%. One man can do the job without special tools or fittings in just a few minutes.

### Is it flame resistant?

Thermaflex will stand 1200°F.\* without any sign of combustion or melting. The covering used in its construction is approved by Underwriters' Laboratories, Inc.

### What pressures will Thermaflex handle?

25 psi, which is 5 times the minimum standards of the New York Board of Standards and Appeals.

### How long will it last in service?

Much longer than rigid metal ducting. It is impervious to moisture, rust, rot, fungus and mildew.

### How flexible is Thermaflex?

It takes tight bends with a radius equal to half its own diameter with practically no decrease in cross-sectional area.

### How is Thermaflex sold?

In a wide variety of diameters in standard 12-foot lengths that can be easily spliced or cut for long or short runs.

### How can I make sure that Thermaflex will solve my problems?

Write us, outlining your requirements. Our engineers will be glad to put their experience to work for you. Write Dept. 67.

\*As approved by the New York Board of Standards and Appeals.

## Flexible Tubing

CORPORATION

GUILFORD, CONNECTICUT • LOS ANGELES 64, CALIFORNIA

Circle No. 64 on Reader Service Card

### JAMES EMMETT DIES OF HEART ATTACK; V.P. OF MARSH CORP.

James Emmett, Jr., 52, vice president in charge of sales for Jas.



P. Marsh Corp. and a past president of Air Conditioning & Refrigeration Institute, died June 7 of a heart attack. The incident happened while he

was on his way to his home in Hinsdale, Ill., following a business trip to Texas.

Emmett had been with the Marsh organization for more than 30 years, starting as a salesman and later becoming sales manager. He had been vice president of the company since 1956. President of ARI in the 1955-56 term, he was director of the organization at the time of his death.

Born in England, he was educated at Oxford. He is survived by his widow, Eugenia; two sons, James III and Richard; a daughter, Mary; and his parents, Mr. and Mrs. James Emmett of Magnolia Springs, Ala.

### BLAKE THOMAS CO. NAMED RECORD DISTRIBUTOR

The Blake Thomas Co., a new firm just established in Effingham, Ill., has been appointed a distributor of air conditioning and commercial refrigeration products for Record Corp.

With headquarters and warehouse in Effingham, the Blake Thomas Co. will be in a position to serve Kansas, Missouri, southern Illinois and southern Indiana.

H. Blake Thomas is owner of the new company. He was vice president in charge of sales and advertising for McQuay, Inc. until March of this year.

### DRAYER-HANSON NAMES SALT LAKE CITY AGENT

Midgley-Huber, Salt Lake City, has been named exclusive Drayer-Hanson sales agent in the states of Utah and Idaho.

# **KRAMER**

## **"F"**

### **THERMOBANK**

#### **OPENS**

##### **A NEW ERA**

###### **IN**

###### **REFRIGERATION**

###### **OF**

###### **FRESH FOODS**



## **A NEW THERMOBANK DESIGNED SPECIFICALLY FOR FRESH FOOD**

For years, research and experience in the fresh food storage field have emphasized that most fresh food can be kept in salable condition for considerably longer time when stored at 30° to 32° with a minimum variation of temperature and humidity. The new "F" THERMOBANK provides, for the first time, an economical refrigeration system for fresh food at the 30° to 32° level and it embodies all the valuable features of the THERMOBANK re-evaporative hot gas defrost system that have made THERMOBANK the standard of the industry.

### **LIFE OF FRESH FOOD EXTENDED**

With the old "off-cycle" defrosting, there are continual wide temperature and humidity fluctuations and it is not possible to maintain temperatures below 35°. The new "F" THERMOBANK eliminates "off-cycle" defrosting and maintains constant temperature and humidity by operating with the fewest possible defrost periods of the shortest possible duration; "F" THERMOBANK means less waste, longer shelf life, less dehydration, less mold and bacterial infection and retention of "freshness" during storage.

### **"F" THERMOBANK COSTS LESS**

Because the "F" THERMOBANK guarantees rapid and complete defrost, equipment is safely selected for 20 hours operation. This results in the selection of a smaller THERMOBANK system and a smaller compressor giving low first cost and economical operation.

WRITE FOR BULLETIN TV-380

**KRAMER TRENTON CO.**  
TRENTON 5, NEW JERSEY

43 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

Circle No. 65 on Reader Service Card

## ABOUT PEOPLE . . .

*Continued from page 32*

**John H. Price** has been named eastern manager of Foamglas low temperature sales by Pittsburgh Corning Corp. He will be located at the company's Philadelphia district office.

**Larry Nordine** has been named western regional sales manager for the Williams Div. of Eureka Wil-

liams Corp. He will work the middle and far west, with headquarters in Bloomington, Ill.

**Robert O. Scheible** and **Lawrence J. Pahl** have been appointed to the newly created posts of divisional sales manager by Sherer-Gillett Co. Scheible has been with the company since 1946, and has been assistant sales manager since 1956. He will cover Ohio from headquarters in Columbus. Pahl will cover Indiana from headquar-

ters in Indianapolis. **Patrick W. Gammon** has been moved from Lansing to Marshall to replace Pahl; **H. Don Warner** will replace Gammon in Lansing; and **Vaughn J. Schott** will take over as factory salesman in Marshall. In other Sherer-Gillett promotions, **Arthur G. Merkle** has been named vice president in charge of engineering; **Myron K. Ballard** has been named vice president in charge of factory operations; and **Mahle L. Shellenberger** has been named production manager.

**Dave Levinson** and **Walter Brodz** have been appointed sales engineers for Acme Industries, Inc.,



D. Levinson

W. Brodz

in the St. Louis area. Levinson, a manufacturers' representative for the past five years, previously was with Surface Combustion and American Radiator. Brodz had been with U. S. Radiator, Austin Engineering, and Smith, Hinchman & Grylls, Detroit.

**Charles P. Strickland Jr.** has been named industrial sales manager of the southwest district for York Corp. subsidiary of Borg-Warner. He will be responsible for the sale of York industrial air conditioning and refrigeration products in the states of Louisiana and Texas and portions of Alabama, Arkansas, Mississippi, and New Mexico. His headquarters will be in Houston.

**Lewin-Mathes Co.** manufacturer of copper and brass tube, pipe and rod, has announced several organizational changes: **Bill Herlihy**, formerly of the New York office, has been made Tampa manager. **Fred Bratt** has been added to rod



- 1 All parts are at your finger tips when you remove one thumb screw.
- 2 You never need to remove the permanent refrigeration, power or water drain lines.
- 3 Machine bolts with lock nuts are used throughout construction . . . no sheet metal screws!
- 4 Extra large Facetized\* fin coil assures maximum heat transfer.
- 5 Pre-determined spacing and slotted hangers for easy, exact installations . . . fans can't be blocked in installation.

Tenney's exclusive easy-to-service design saves time and effort! Modern, semi-circular shape insures maximum all-over air distribution . . . compact sizes add to usable work area. Load right up to unit because pan can be removed from any direction . . . double drain trough pitched toward connection and insulated . . . controlled horizontal airflow eliminates uncomfortable direct drafts.

Twin motors and fans give double protection . . . a single motor will maintain safe temperature . . . attractive covers have rust proof baked-on finishes . . . filters are available for applications requiring clean air circulation . . . female pipe thread adapts drain connection to any line . . . units skillfully engineered for long, dependable service.

There's a Tenney TW unit cooler for every refrigeration job.

For complete information write for Bulletin 103-54 TODAY!

\*PATENTED



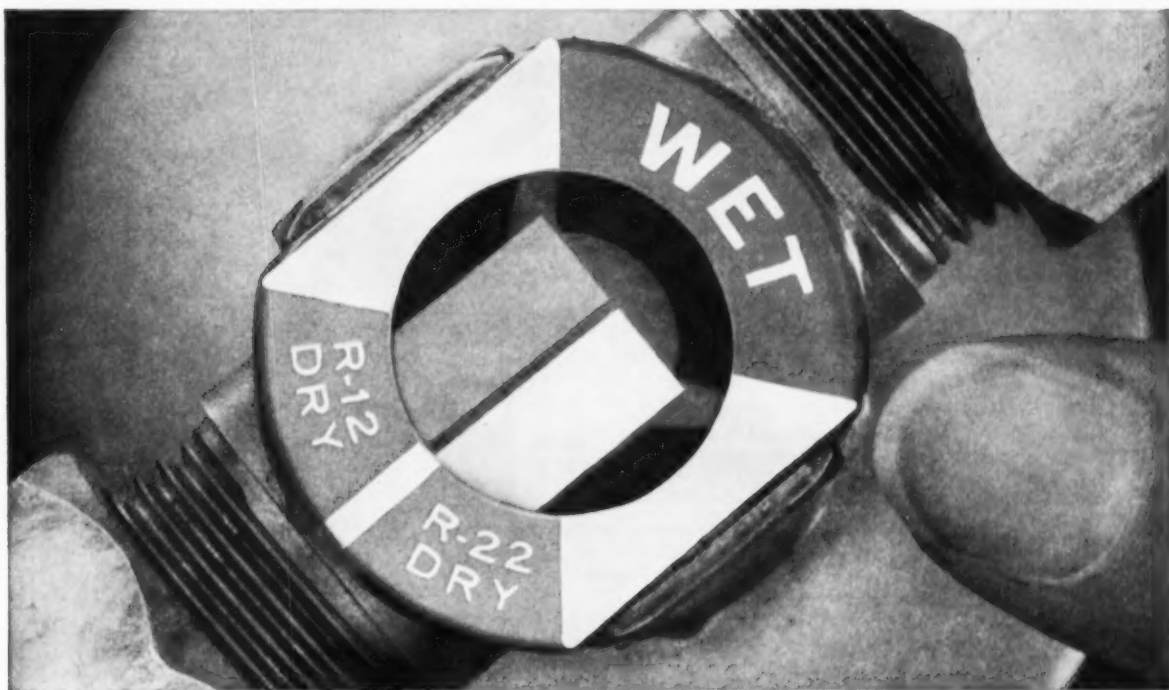
**Tenney**

ENGINEERING, INC.  
1090 SPRINGFIELD ROAD, UNION, N. J.  
Plants: Union, N. J. and Baltimore, Md.

Engineers and Manufacturers of Refrigeration and Environmental Test Equipment  
Circle No. 66 on Reader Service Card

# IT'S HERE!

The world's first moisture indicator with a built-in sight glass. The new **ANSUL SUPER DRY-EYE** tells you at a glance if the refrigerant is dry or dangerously wet, and lets you see the condition of the refrigerant. Here are the four big servicing questions the super **DRY-EYE** answers for you scientifically!



**Q.** If I am using Freon-12 how will I know if it is dangerously wet or dry?

**A.** Just look through the big window at the R-12 indicating element. If it is blue the refrigerant is safe; less than 10 parts per million of moisture present. If it is pink, moisture has climbed above 30 ppm—time to change driers.

**Q.** If I use Freon-22 in a system how will I know if it is wet or dry?

**A.** If the R-22 element is green your refrigerant is in safe operating condition—less than 20 ppm of moisture. If the element shows pink, moisture has reached the 25 ppm level; time to change driers and avert a costly breakdown.

**Q.** Will the Super Dry-Eye tell me if there is a low refrigerant charge?

**A.** Yes. The fused glass window, the first proven *leak-proof*

*sight glass* in the industry, permits visual inspection of the refrigerant at all times. Bubbles indicate a low refrigerant charge or a possible restriction in the line.

**Q.** Is there a simple, economical way of correcting the problems which the Super Dry-Eye tells me about?

**A.** The T-fitting which houses the Super Dry-Eye can also serve as a connection for an Ansul T-Flo drier without an additional break in the line. The drier screws in like a light bulb and hand tightening gives a leak-proof seal.

The Ansul Chemical Company, Marinette, Wisconsin



and tube sales in the Detroit office. **Al Dennison** has joined the New York office as manager of brass rod sales. **Dick Lowrey** has been appointed manager at Dallas.

**George J. Dunn** has been named eastern sales manager of Remington Corp. He will be responsible for all sales activities in an east coast area extending roughly from Washington to Pittsburgh to Cleveland to Boston, for Rem-

ington's incremental system of air conditioning for multi-room structures. Dunn was for many years sales supervisor for Harvey-Whipple Inc., manufacturers of oil heating equipment, and a district manager for Iron Fireman.

**P. J. Petropoulos** has been appointed account manager of the newly combined air conditioning and refrigeration and standard products accounts in the Worthing-

ton Corp. Harrison plant Advertising & Sales Promotion Depart. Serving with Petropoulos as account supervisors of air conditioning and refrigeration product promotion are **F. A. Paine** and **H. J. Newbauer**, both formerly Assistant Account Supervisors. Paine will handle central station and industrial product promotion, and Newbauer will handle packaged product promotion.

**C. G. Baker**, of Atlanta and **E. E. Weil**, of Elizabeth, N. J. have been named factory representatives by Tube Manifold Corp. as part of the introductory program covering TMC filter-driers.

**Edward Albin** has been appointed sales engineer for Dunham-Bush, Inc. in the company's St.



E. Albin

D. Keuch

Louis territory. He formerly was regional sales manager for Anchor Heating Co. of New Albany, Ind. **Dean Keuch**, sales engineer, has been transferred to the Cleveland area. He joined the company in 1955 and has been working out of the West Hartford, Conn. factory.

**Alexander Black**, vice president in charge of sales for San Diego's Solar Aircraft Co., has been named executive vice president and general manager of Weber Showcase & Fixture Co., Inc., Los Angeles.

**S. E. Vickers** has joined the Contract Div. of Cory Corp., serving private label air conditioning accounts. He was formerly with Addison Products Co., Addison, Mich., where he was vice president and director of research.

**Simpson TEST EQUIPMENT**

*speeds up servicing of*

**REFRIGERATION  
AIR CONDITIONING  
HEATING EQUIPMENT  
APPLIANCES**

**CHECKS 3 TEMPERATURES AT ONE TIME**

**THERM-O-METER, Model 388-3L** (-50° to +1000° F)

Takes up to three, 7½' thermocouple leads, general purpose or surface type. Self shielded. With one general purpose lead, battery, and operator's manual..... **\$64.50**

Model 388 for one lead only..... **\$59.50**



MODEL 388-3L

**TEMPERATURE METER, Model 385-3L** (-50° to +70° F)

Developed for refrigeration equipment. Takes up to three, 15' general purpose Thermistor tipped leads. With one lead and manual.... **\$33.95**

Model 385 for one lead only..... **\$30.00**



MODEL 385-3L

**PRETESTS CURRENT CAPACITY OF ELECTRICAL LINES**

**LINE-O-METER, Model 397**

Tells whether existing house wiring is adequate for motor starting currents from 13 to 50 amperes. (Single phase, 117 V, 60 cycles).... **\$29.95**



**DIAGNOSES MOST ELECTRICAL TROUBLES**

**AC VOLT-AMP-WATTMETER, Model 390**

Checks line voltage, current drain, and power consumption. Four wattage ranges cover practically any appliance. With break-in plug, leads, and manual..... **\$43.95**



**CHECKS VOLTAGE AND POWER SIMULTANEOUSLY**

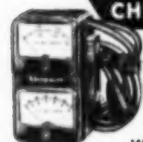
**AC-DC VOLT-WATTMETERS, Models 391 and 392**

For appliance motor testing. **\$34.95**

Model 391, 3000 watts.....

Model 392, 5000 watts..... **\$37.95**

Write for New Refrigeration Bulletin No. 3001



**SIMPSON ELECTRIC COMPANY**

WORLD'S LARGEST MANUFACTURER OF ELECTRONIC TEST EQUIPMENT  
5200 West Kinzie St., Chicago 44, Ill. • Phone: Elston 9-1121  
In Canada: Bush-Simpson Ltd., London, Ontario



Circle No. 68 on Reader Service Card



# Refrigeration

## Serves Big Armour Laboratories



Above: Three of four Shell-and-tube condensers at the Laboratories.

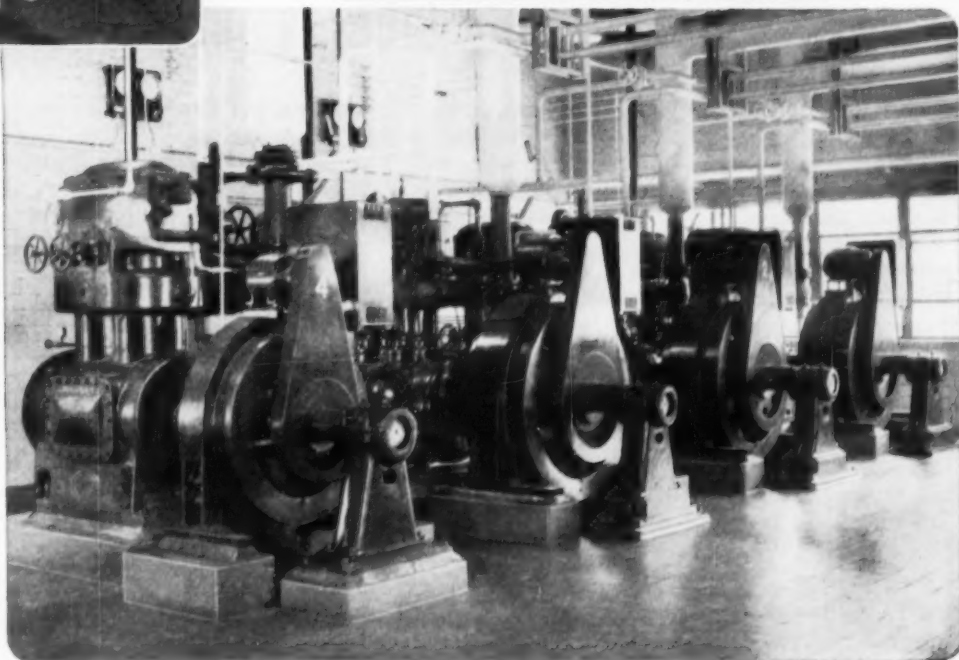
Armour and Co. use "cold" in many ways in their great Pharmaceutical Laboratories, recently opened near Kankakee, Ill. These uses include air conditioning, biological process work, cold storage, heat-pump service, and research.

Temperatures can be held anywhere between  $-45$  and  $+45$  degrees F., but usually go no lower than  $-10$ .

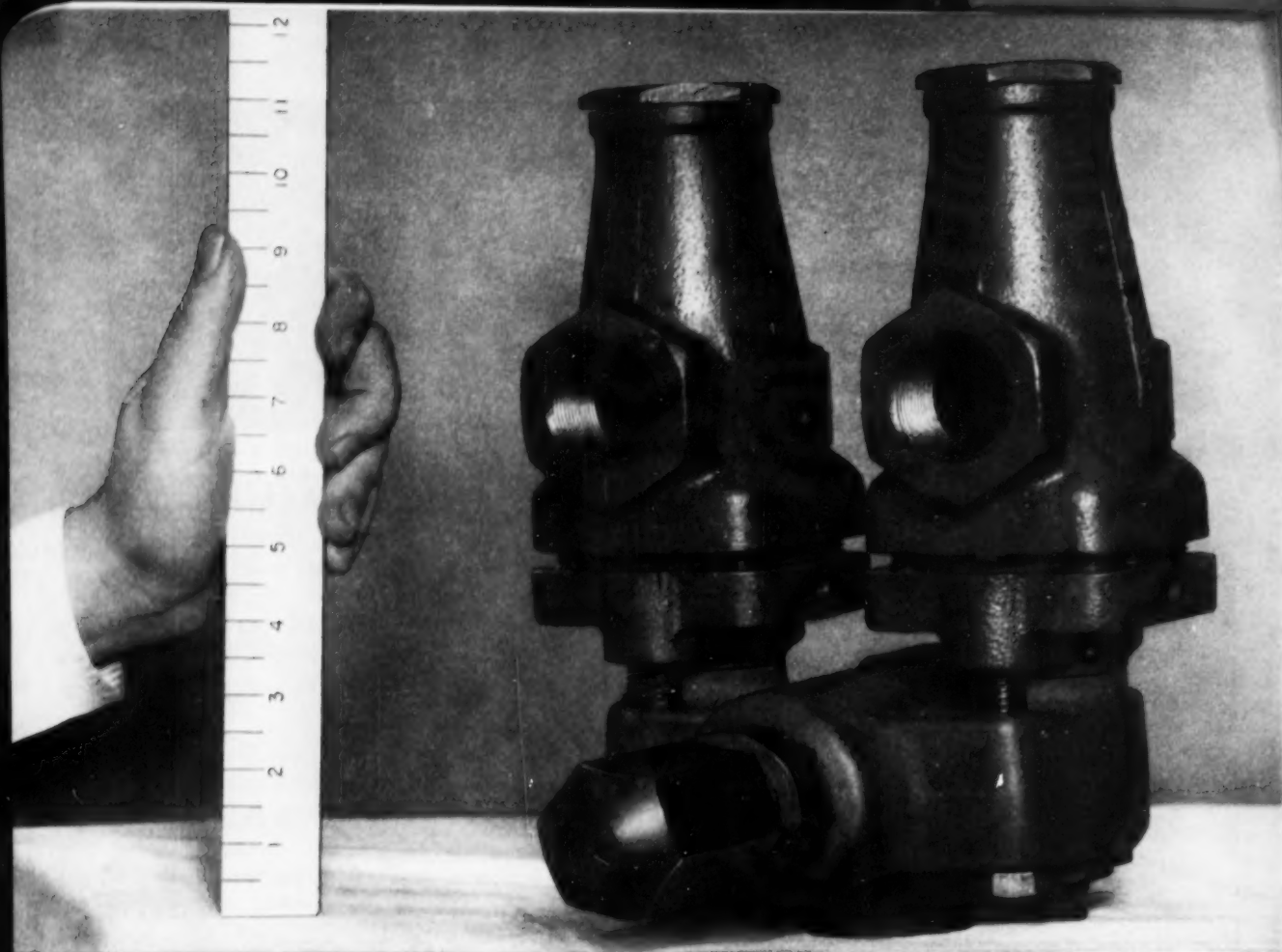
Here a 2-stage Frick system of 1422 tons refrigerating capacity operates with efficiency and economy. Installation by Midwest Engineering and Equipment Co., Frick Sales-Representatives in Chicago.

For that important refrigerating, air conditioning, ice making or quick freezing job of yours, look to dependable Frick equipment. Sales-engineering and service, the world over. Let us submit estimates now: write, wire or phone

DEPENDABLE REFRIGERATION SINCE 1882  
**FRICK CO.**  
WAYNESBORO, PENNA., U.S.A.



Right: Four of eleven ammonia compressors furnishing refrigeration at temperatures down to  $-45^{\circ}$  F. for The Armour Laboratories, Kankakee, Ill.



3/4" Valve Illustrated

## New, smaller YORK valves with 3 times capacity save you assembly labor, valuable headroom

A complete new line of York safety relief valves presents new ideas in valve design — a new principle of reaction for quicker opening and elimination of connecting nipples and flanges. As a result, these high-capacity valves are smaller than standard models, can be used to do the job formerly requiring a valve one or even two pipe sizes larger.

**DESIGNED TO MEET ASME AND ASA B-9 standards** York's new safety relief valves also have National Board Certification for capacity. They're available for use with ammonia, "Freon", "Genetron", and "Isotron" . . . either singly or in dual assemblies . . . with settings from 50 to 300 pounds.

**NB**  
National Board  
Certified

**UV**  
ASME

**NEW VALVES ARE SAFE, ACCURATE**, and they relieve at set pressure. Superior design and use of special materials including stainless steel, cadmium plating, aluminum and modern synthetics for spring, valve button, and other moving parts prevents sticking from rust, corrosion and cold-welding. Thus they release virtually at pressure setting—well within pressure tolerances of code standards. In addition, the oval flange inlet permits bolting directly to the new smaller dual stop valve for added strength.

The full, new line of York valves is available right now from your York Wholesaler. Contact him or your nearest York Branch office (listed in the Yellow Pages of your telephone directory) today for Genuine York Accessories & Supplies.



Circle No. 70

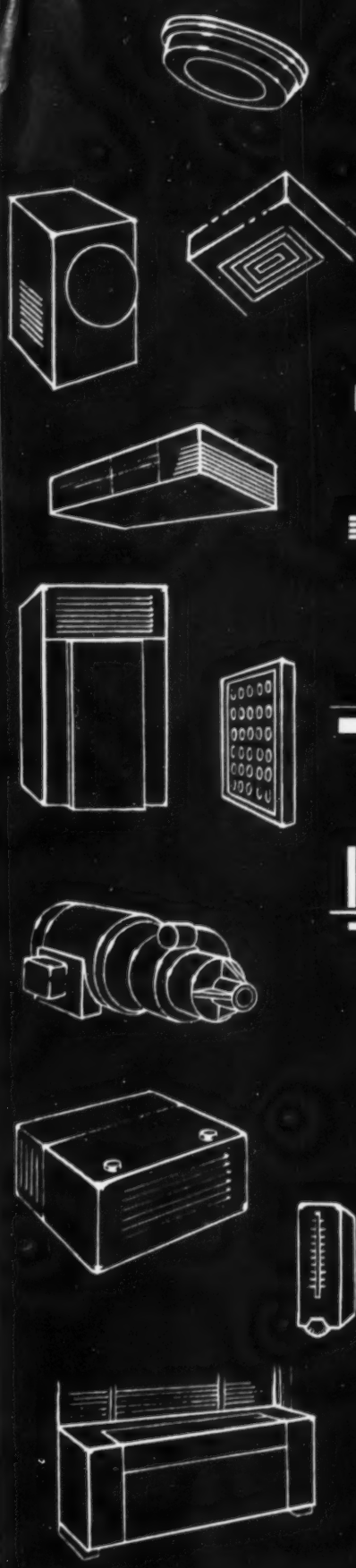


HEADQUARTERS  
FOR MECHANICAL COOLING  
SINCE 1885

# YORK

C O R P O R A T I O N

SUBSIDIARY OF BORG-WARNER CORPORATION



# Conditioning Section

HEATING • CIRCULATION AND HUMIDITY CONTROL



RESIDENTIAL



INDUSTRIAL



COMMERCIAL



INSTITUTIONAL

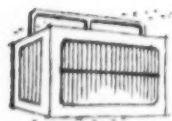
## READER'S GUIDE

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*Honeywell sets a new standard in refrigeration controls*

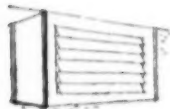
# Never have 2-stage thermostats been so dependable...so versatile

*... and so low in cost!*



For capacity control of compressors for water chillers—  
the New L6021C

Ideal for chillers which are part of a central cooling system using chilled water. The versatile new L6021C adapts to any heating-cooling application in which sensing is required between the ranges of minus 20 and plus 75 degrees. Provides either one or two-stage control.



For 2-compressor store coolers  
—the L6018D

Especially designed for packaged air conditioners having two compressors, the L6018D activates one or both compressors as needed, depending on the cooling requirements. The L6018D may be mounted on wall or within a panel; is available with various mounting brackets. Fixed 2° differential per stage, 2° between stages. Adapts to any heating-cooling application lying between ranges of 55° to 85°.

## All Honeywell refrigeration controls offer these features:

- Fast-acting response
- Versatile switching action with MICRO SWITCH switches
- Close temperature control
- Sturdy, compact design
- Available with or without case
- Easy to mount and install
- Underwriters' approved



### *The new Honeywell L6021C*

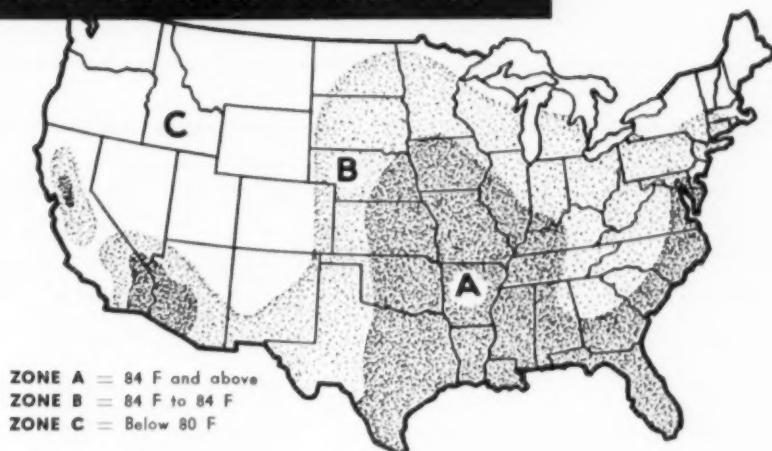
Get full information on the new L6021C, the L6018D and on Honeywell's complete line of heating-cooling controls. Call your local office or write Minneapolis-Honeywell, Dept. CR-7-127, Minneapolis 8, Minn.

# Honeywell



*First in Controls*

## "MUST" READING FOR SALES-MINDED MEN



Here are your market hot spots

## Comfort Engineering: *will it open the door to a real residential boom?*

**"COMFORT Engineering"**—the application of accepted engineering principles to the design of dwellings in order to provide maximum comfort at the least possible over-all cost — may be the long-missing key that opens the door to the potentially tremendous market for central air conditioning systems for the average home.

It can build bigger and better markets for residential heating and air conditioning equipment.

It can help equipment manufacturers sell more units, cut their production and selling costs, increase their profits.

It has the power, too, to switch the business of the unwary manufacturer or contractor. It can shift the emphasis of many producers, make some products obsolete, give others a big boost.

This industry of ours is made up of many parts. But we all have the same objective. We all try to create indoor comfort.

Some parts of the industry produce furnaces and air conditioners; others ducts, controls, filters and insulation products; still others provide design and installation services. No single element can live alone; we are dependent on each other; our customers need us all to get the comfort they want.

For years and years this industry has accepted any heating or cooling task, with little concern for costs or building economics. It has been willing to put heat into, or remove it from, buildings that leaked heat as a sieve leaks water. Only the building insulation segment of the industry has been seriously concerned.

Now insulation producers have become vocal about the problem. They have undertaken economic research that has produced important results.

Perhaps the most significant study is our "Low Cost Comfort National Test Program" inspired by an assertion of Robert Thulman, former FHA engineer, that "the average home, built anywhere in the United States, ought to be heated and cooled for \$10 a month."

Through the cooperation of public utility companies and over 150 home builders in 50 cities in all climate areas of the U.S., we now have about 165 houses in our program which are sub-metered and undergoing a two-year study of actual operating costs. These houses were "comfort engineered."

First, we insisted on maximum practical use of insulation. Second, we required that sunny windows be properly shaded by exterior devices such as overhangs and sun screens or heat-absorbing glass. Third, we required good ventilation of roof or attic spaces to

# Comfort Engineering: its sales arithmetic . . .

HOW COMFORT ENGINEERING STANDARDS AFFECT HEATING COSTS

|                        | A                                      | B                      | C  | D                                    |
|------------------------|--|------------------------|--|--------------------------------------|
|                        | Net Cost of Winter Comfort Engineering | Annual Savings in Fuel | Time to Repay Extra Cost of Comfort Eng. | 30-Year Net Savings in Heating Costs |
| Zone 1 North (30)      | \$86.30                                | \$33.88                | 2.5 years                                | \$930                                |
| Zone 2 Central (42)    | 106.65                                 | 31.03                  | 34 years                                 | 824                                  |
| Zone 3 South (28)      | 90.86                                  | 14.05                  | 6.5 years                                | 331                                  |
| National Average (100) | \$96.12                                | \$27.13                | 3.5 years                                | \$718                                |

HOW COMFORT ENGINEERING STANDARDS AFFECT AIR CONDITIONING COSTS

|                        | A                                    | B                                | C  | D                                      |
|------------------------|--------------------------------------|----------------------------------|--|--|
|                        | Net Cost of Year Around Comfort Eng. | Annual Savings in Fuel and Power | Time to Repay Extra Cost of Comfort Eng. | 30-Year Net Savings in Operating Costs |
| Zone 1 North (30)      | \$43.97                              | \$45.43                          | 11.5 months                              | \$1319                                 |
| Zone 2 Central (42)    | 45.34                                | 50.77                            | 10.7 months                              | 1478                                   |
| Zone 3 South (28) Save | 32.99                                | 68.05                            | Prepaid                                  | 2074                                   |
| National Average (100) | \$22.99                              | \$54.00                          | 5.1 months                               | \$1597                                 |

*Continued from preceding page*

further reduce the costly impact of sun heat on cooling loads. Of course we required that the heating and air conditioning units installed in these houses be sized in proper relationship to the summer and winter loads as reduced by these improvements.

Here are some things we found to date: where heating alone is involved, comfort engineering standards increased the builder's initial cost of insulation over FHA minimums by \$96, but thereafter saved the owner \$27 a year which repaid the investment in 3.5 years.

The small extra cost is but a fraction of 1% of the house cost; it is less than the difference in competitive bids on any major element of house cost; and it can be offset by such minor design changes as a few square feet of ceramic tile in baths or kitchens, the omission of some decorative detail of masonry on the exterior, or by the elimination of a minor gadget.

Where year-around air conditioning is involved, comfort engineering adds only \$23 to FHA minimum costs but annually saves \$54 in owner's operating costs. Thus the extra cost is repaid in five months. This lower cost is due to bigger savings on cooling units than on heating alone.

More importantly, in the deep South the builder can save about \$33 in initial cost. In other words, he cannot afford not to use maximum insulation when he adds air conditioning.

The "extra" cost of comfort engineering is due to the use of maximum instead of minimum quantities of insulation, plus window shading devices and extra ventilation where needed. From this total we then deduct the difference in cost between the larger heating and cooling units needed under FHA minimums and the smaller units that will handle the reduced loads due

to comfort engineering. When we reduce heat transfer, we reduce power and fuel requirements for the life of the building.

Of course, part of the initial cost saving comes out of your sales pocket. You sell a smaller unit than would have been needed if the owner never heard of comfort engineering.

## How the Industry Would be Helped

But equipment manufacturers will be generously benefitted by the wide adoption of comfort engineering standards. Here are 10 reasons:

(1) The trend toward operating economy is desirable and practically inevitable. One of the industry's experts recently said: "Up until now there has been an apparent willingness on the part of this industry to attempt to heat or cool anything that can be erected. In my opinion," he added, "this has been a short-sighted point of view, but a perfectly natural one. We have given lip service to good construction practice, including insulation, but we have not gone as far as we might in insisting upon it."

(2) The FHA has been under pressure to raise its insulation standards because it has the task of lessening the risk of the mortgage lender. If a home buyer has a more comfortable house, by reason of good insulation as well as good heating, and he can heat it at less cost than formerly, he has more money available to meet his mortgage payments. So FHA finds that more insulation is good business. It has already issued to its regional administrators a tentative draft of a revised Minimum Property Requirement relating to insulation.

The proposal is to limit the permissible heat loss

# ... its market growth factors

**RESIDENTIAL HEATING UNITS**  
How FHA Requirements Affect Market Demand

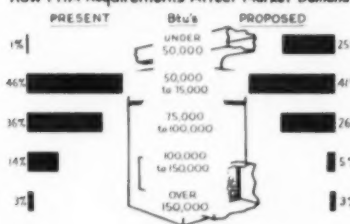


FIGURE 1

**RESIDENTIAL HEATING UNITS**  
How 'Comfort Engineering' May Affect Market Demand

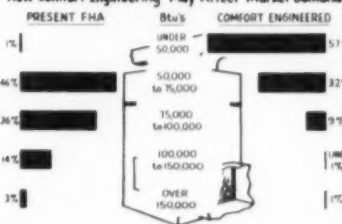


FIGURE 2

**RESIDENTIAL CENTRAL AIR CONDITIONERS**  
How 'Comfort Engineering' Affects future Markets

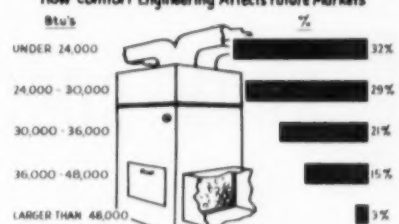


FIGURE 3

from a house in a graduated scale related to climate. Up to now the basic limitation has been a maximum hourly heat loss of 55 Btu per sq. ft. of livable space. This has had no major effect on houses located in temperate or warm climates.

The new plan applies the 55 Btu loss to areas where the design outdoor temperature is -20 F or lower. Then the limit drops to 50 Btu, 45 Btu, 40 Btu and 35 Btu per sq. ft. as designed outdoor temperatures rise in 10 F spreads to plus 20 F.

Fig. 1 shows graphically what this new MPR will do to the new house market. At the left are the heating units required in different sizes to serve the new house market under existing FHA requirements. At the right are the heating units of different ratings that would be needed if the new FHA regulations were made effective.

## Demand for Smaller Units Will Boom

Note the tremendous growth in demand for small units. Units rated less than 50,000 Btu grow 25 times in demand; the larger units shrink in demand. Combining the two smaller sizes shows that units under 75,000 Btu now command 47% of the market but in the near future they may take 66% of new house sales.

Fig. 2 shows what comfort engineering standards would do if universally adopted.

For example, the small units may increase over 50 times in sales while the demand for the large sizes above 100,000 Btu may practically evaporate. The two smaller sizes combined will hog about 90% of your future markets instead of 47% as of today.

(3) FHA at present has no Minimum Property Requirement for air conditioned homes. But it is under pressure to recognize air conditioning as a de-

sirable sales feature and has created an advisory committee to guide it in this field.

One of the factors bound to influence FHA decisions is the demand of the electric heating industry for maximum insulation as a pre-requisite to an electric installation. Their 6-4-2 rule (meaning 6" of mineral wool or equivalent insulation in ceilings, 4" in side-walls and 2" in floors) naturally delights the manufacturers of insulation. But since everybody knows that it takes from three to seven times as much energy to remove a Btu of heat as to add it to a house, and since most cooling equipment now sold uses electrically driven compressors, it is logical to apply the 6-4-2 concept to cooling installations.

This is exactly in step with comfort engineering standards. The wisdom of such a practice is amply demonstrated by our Low Cost Comfort National Test Program.

Fig. 3 shows what our Low Cost Comfort studies indicate will be the distribution of demand for central air conditioners in the future. Units rated at 24,000 Btu or less will represent 32% of the market, with units rated between 24,000 and 30,000 Btu representing the next largest segment (29%). Note that these two smaller sizes should satisfy 61% of the future new-house demand.

The next two sizes, from 30,000 to 48,000 Btu should satisfy 36% of the market. But there is no need for a 5-ton unit as a special residential item. The last 3% of the house market can probably better be handled by custom adaptations of commercial units.

These figures are all related to the new house and do not reflect the replacement business. Also,

*Continued on page 96*

**FRONT** section of the second-floor furniture display of this New Orleans office supply dealer is cooled by these two 1½-ton window units mounted in standard double-hung sash.



## ROOM COOLERS turned the trick . . .

**REAR** section of the floor is handled by another two 1½-ton units like this one, installed in the bottom panel of the factory-type steel sash windows that were available for this use.



. . . for this office equipment dealer who needed cooling to keep his customers comfortable while shopping the store's furniture display floor

**E**ARLY last year, the "top brass" of F. F. Hansell & Bro., offices furniture dealer in New Orleans, La., took a long, searching look at their own firm's office furniture merchandising policies. The question paramount was, "Is it a pleasant experience to shop for office furniture in our store?"

The answer to that was a qualified "No", reports Victor Hayes, Hansell executive, for this critical analysis revealed that in all honesty the Hansell store would have to admit that too often during the summer months the office furniture prospect would take a hasty look at the desk, chair, files, or

other furnishings recommended by a salesman, and then get downstairs into the cool retail office supply department on the first floor to "talk it over".

"Actually, we were in precisely the same situation as many other office furniture retailers whose stores are located in areas where hot weather is a problem in summer months," Hayes points out. "Like most others, we felt that the relatively small amount of traffic involved on the furniture floor, in comparison with the large amount of space required to display it effectively, almost automatically ruled air conditioning out of the picture as prohibitively expensive.

"There just didn't seem to be much sense in spending a relatively large amount of money to cool a space which is seldom occupied by anyone at all. Consequently we had attempted to get along without air conditioning, even when the outside temperature was nudging the 100 F mark."

With the New Orleans market expanding sharply, however, and more aggressive salesmanship required to maintain volume, the Hansell organization determined to follow the direction indicated by its own internal analysis.

Expense or no expense, the management became convinced that it was a serious mistake to attempt

to get along without the advantages of air conditioning in the firm's furniture display area. It was obvious that it actually was uncomfortable for a prospect to spend more than a few minutes on the office furniture floor, despite the fact that it was tastefully decorated and equipped with plenty of fans.

Consequently, the New Orleans office furniture dealership set about the job of air conditioning this furniture floor "on a practical basis".

Installation of a remote system sufficient to cool this space measuring more than 100' deep by some 30' wide, was out of the question, due to the large amount of remodeling which would have to be carried out to accommodate the long runs of refrigerant lines, electrical wiring, and ductwork. So, F. F. Hansell & Bro. decided to try a simple installation of package air conditioners, which could be located in the windows at the front and the rear of the furniture display floor.

"We didn't try to kid ourselves," Hayes explains. "We realized that using window coolers might not give us the best possible air conditioning system for this area, but we did feel that the package units would give us enough cooling to serve our purpose, at a cost which would make sense in terms of the economics of our business."

The equipment finally decided upon consisted of four 1½-ton room air conditioners, two of which were installed in windows at the front of the display floor and two in windows at the rear. This combination has proved adequate to maintain a temperature of between 75 and 85 F in the furniture display area even during the notoriously torrid summer months commonly experienced in New Orleans.

Despite the fact that the building itself is uninsulated and is exposed to a heavy sun load throughout most of the daylight hours, the four 1½-ton window units have been able to produce satisfactory results principally because of the nature of the use of this furniture display level.

*Continued on page 97*

## **Q** What's a Thermosiphon?

**A** A cold vapor heating system in which a refrigerant replaces water in the radiator coils.

## **Q** What are its advantages and possibilities?

**A** This article will tell you:

**A** COLD vapor "thermosiphon" heating system, in which a gas normally used as a refrigerant is piped through radiator coils in place of water, offers interesting possibilities for the heating of churches, motels, garages, and similar buildings that need only intermittent service.

Developed by R. Th. Eichmann, chief engineer of the Swiss firm, Carba, the system already has been tested in several European installations, and patents have been applied for both in Europe and the United States. Eichmann says his heating system seems particularly promising for buildings which need heating only intermittently and in areas where low temperatures make a quick heat especially advantageous.

Big advantages, he points out, are in the speed and uniformity of the heating. The cold vapor system, he claims, is six to seven times faster than conventional hot water radiation heating, being capable of raising the temperature in a building such as a church as much as 34° F. in 1½ hours, and eliminates the danger of freezing pipes during shut-down periods.

The cold vapor system resembles the usual hot water or steam radiator heating plant rather closely in operating principle. Major difference is in substitution of "Freon-114" dichlorotetrafluoroethane for water in the heating coils, and addition of a shell and tube heat exchanger to the normal coal, oil, or gas fired boiler.

Pipes carrying the refrigerant through the radiation system pass through a heavily insulated heat exchanger in which hot water or light mineral oil is used to vaporize the Freon.

Freon-114 is of particular value as the heat transfer medium, Eichmann says, because its low heat value means it can be converted into vapor more quickly and economically than can water. This not only provides more rapid heating but also eliminates the need for circulating pumps to get the heat quickly to all parts of the system.

Lack of moving parts in the refrigerant circuit lessens the chance of air leaking into the system through pump shaft seals, packing, etc. Air locks, which sometimes occur in hot water or steam systems and cause pipe knocking or cold spots, are thus avoided.

Typical of the Eichmann installations is one in a church in the little Swiss mountain village of Fontainemelon. There an oil-fired boiler is used to heat about 105 gallons of water to approximately 192 F for a heat exchanger through which the Freon-114 passes to and from the radiators. Approximately 330 pounds of refrigerant are used in the system and the heating capacity is rated at 100,000 calories (about 400,000 Btu per hour by U.S. standards).

The water heater, heat exchanger, water lines, and vapor and condensate mains through which the refrigerant flows are heavily insulated with magnesia. That insulation holds enough heat in the

*Continued on page 119*



# Three Keys to HEAT PUMP EFFICIENCY

**U**NDER what circumstances can a heat pump air conditioning system prove advantageous for large commercial or industrial applications?

Actually, there are three answers to that question which combine to form a single basic conclusion:

(1) Whenever total heat loss value balances total heat gain value at a point representing a major amount of time throughout the year.

(2) When adequate electrical power is available at a reasonable cost.

(3) When a suitable and economical source of heat, such as water, can be readily utilized.

Careful analysis showed that all three of these major conditions were satisfied in Tacoma, Wash., so that is why a heat pump system was selected as the year-round air conditioning medium for the new \$2½ million administration building of the Tacoma City Light Department.

Probably one of the finest utility structures in the nation, this new administration building is a modern, all concrete structure 100' wide by 300' long. It presently consists of 4½ stories, but structural provisions have been made for four additional floors in the future.

The building houses not only the Tacoma City Light facilities, but also the Tacoma City Water Administrative Offices, and offices which are the headquarters for a small industrial area railroad system owned by the city.

Anticipating substantial growth in these systems over the next several years, and the varying problems which inevitably arise with growth, the owners stipulated that flexibility be a paramount consideration in the design of their building. For this reason there are very few permanent partitions in the building, outside of the ground floor area which consists of permanent storage rooms, a cafeteria, dining room and large auditorium. Throughout the flexible areas in the majority of the building it was necessary, therefore, to plan that

any expected future subdivision of space would contain electrical and communication outlets, a symmetrical lighting arrangement, and adequate provision for heating, ventilating and air conditioning supply.

Before designing the air conditioning system, a careful analysis was made of the building heat losses and gains throughout the expected temperature range by Worthen and Wing, consulting engineers in Tacoma. The results of this analysis are shown in the graph on the facing page. Note that the total heat loss curve and the total heat gain curve intersect at point "C", approximately 37 F outside air temperature. This is just a little below the average daytime outside air temperature over the entire year, and also represents a typical condition over a large number of daytime hours during the year.

A condition in which maximum heat gain and maximum heat loss are approximately numerically equal is a favorable condition for the use of a heat pump system. Under such circumstances, major items of equipment selected to handle the maximum heat loss will automatically be of a size which will also handle the maximum heat gain. Therefore, when this situation exists the equipment selected will be efficiently used throughout the year.

In the case of the Tacoma City Light building, there were also other items that pointed toward the selection of a heat pump system. With a total heat loss value balancing a total heat gain value at a point representing a major amount of time throughout the year, the heat pump system makes possible the recovery of heat gains in internal portions of the building. When this is used in balancing the heat losses around the perimeter of the building, very substantial economies are realized over any alternate system which would involve the cooling of internal zones, while some fuel such as oil is used to heat exterior zones.

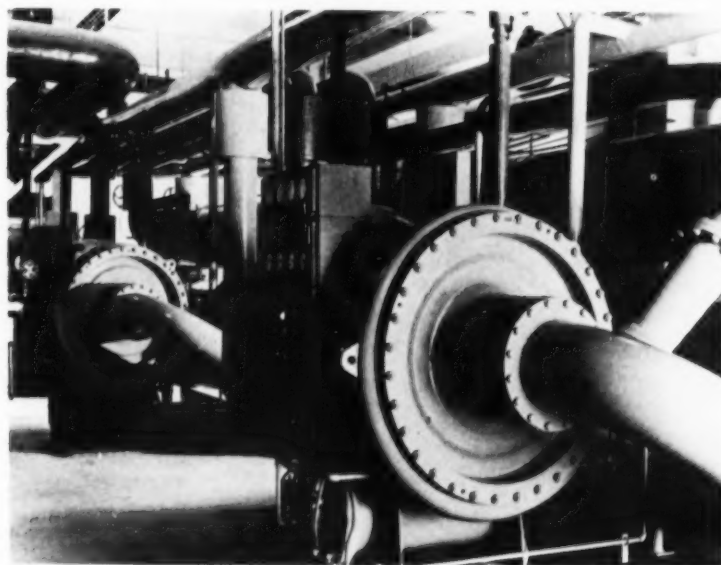
A second important consideration in the selection of a heat pump system is the availability of electrical

*Continued on page 90*



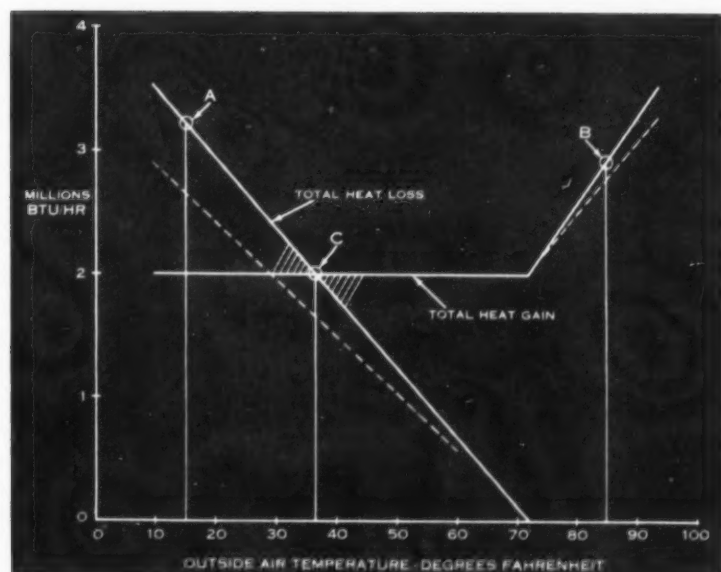
## Here's the Building

New \$2½ million office building of the Tacoma City Light Department was planned for the use of year-round air conditioning.



## Here's the Equipment

Heart of the heat pump system installed is two 150-ton Trane hermetic centrifugal compressors.



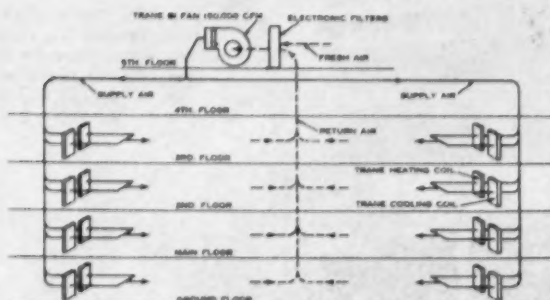
## Here's the Reason

Careful analysis showed that total heat loss value balanced total heat gain value at a point representing a major amount of time throughout the year.

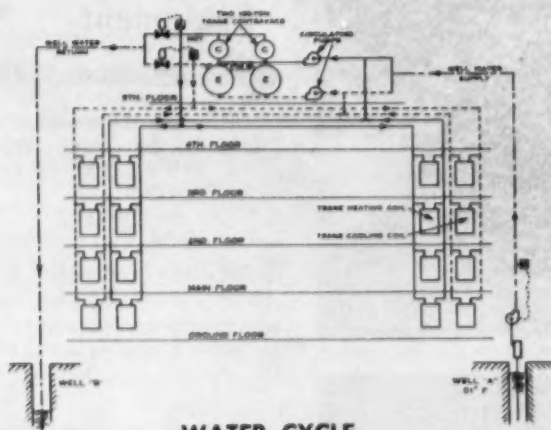
## HEAT PUMP EFFICIENCY

Here's how the 300-ton heat pump system in the Tacoma City Light administration building works. All three operating cycles — air, water, and refrigerant — are shown.

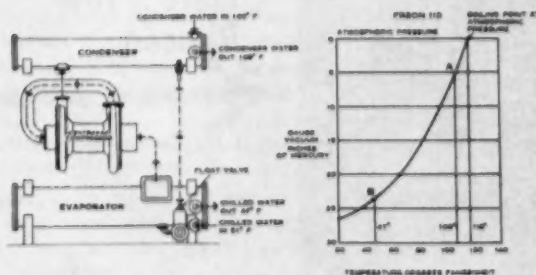
*Continued from page 88*



**AIR CYCLE**



**WATER CYCLE**



**REFRIGERANT CYCLE**

power at reasonable cost. Since Tacoma's extensive hydroelectric system provides electricity at a low rate, this was no problem. Actually, electrical power is virtually the heartbeat of Tacoma, with the city's average resident using three times as much electricity as his counterpart throughout the nation.

A third major consideration is the availability of a suitable and economical source of heat, such as water, which can be used to give up heat during the excess heating load at low temperatures and to absorb heat from the excess cooling load at high temperatures. In this particular case, an ample supply of good quality water was available at the site in two wells at distinctly separated strata.

Therefore, with favorable factors existing on all three points, the heat pump system was selected to be used for the air conditioning system in the Tacoma City Light administration building.

As shown in the schematic diagram of the air cycle in the air conditioning system, a backwardly-inclined fan located in a roof equipment room circulates approximately 150,000 cfm of air through the building. The air travels down four vertical air shafts, one for each quarter of the building.

On each floor it passes through coils in a coil and damper room where it is either heated, cooled or mixed with by-pass air. From there it is funneled through a system of branch ducts and ceiling air diffusers to the various occupied zones.

The air returns through ceiling and window sill pick-ups to a central air shaft, and thence back to the main fan. A minimum amount of fresh air, approximately 25,000 cfm, is introduced continuously at the fan.

The heart of the system's water cycle, as indicated in the accompanying diagram, is two 150-ton

*Continued on page 110*

Look beyond  
its beauty  
and comfort...

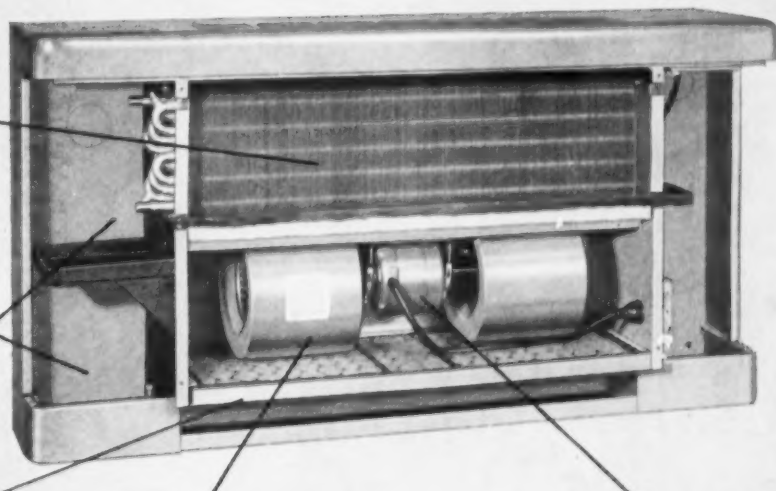


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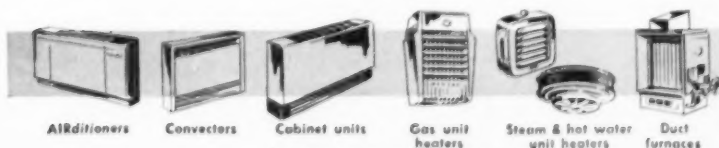
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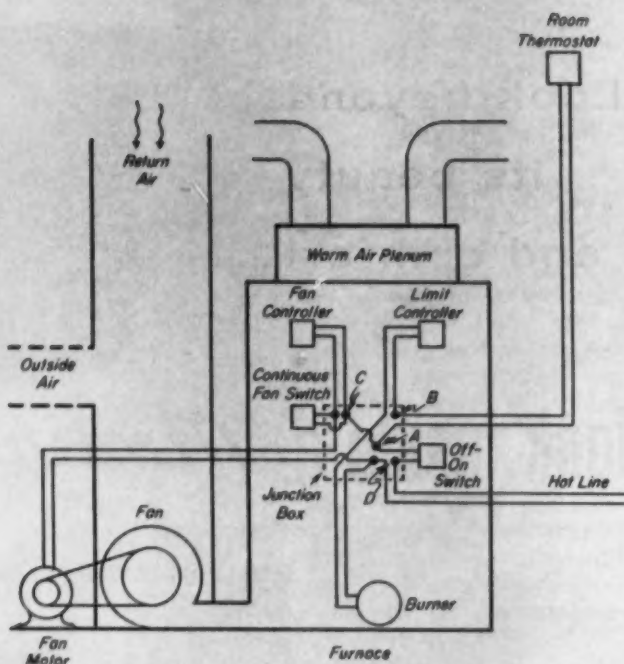
A-1357



In Canada: Sarco, Ltd., Toronto



**FIG. 1**—Residential warm air control system for continuous or intermittent fan operation.



## HEATING CONTROL EQUIPMENT

*... a profitable "plus" for the air conditioning contractor*

**S**ATISFACTORY and safe operation of a heating plant depends upon proper selection, application and maintenance of control equipment. This is true for a single unit heater or a complex system. Heating control sales, application and service know-how is important in any branch of the air conditioning industry. Customers rightly expect the dealer to assume responsibility for trouble-free operation of the equipment he sells and installs.

Heating and cooling controls are often interconnected. Residential and commercial air conditioners as well as room conditioners, in increasing numbers, are being supplied with provision for heating with stand-

ard or optional equipment. These must be equipped with all-year controls.

Names commonly used by the trade to identify controllers and to indicate their use include the following:

1. **Thermostats:** Used to indicate instruments which are actuated by room air temperature.
2. **Limit Controls:** These are used to stop operation of the burner when furnace or heating medium has reached the highest desirable temperature. A limit control is installed in the bonnet of a warm air furnace.
3. **Pressure Controllers:** Commonly used to maintain desired pressure within a steam boiler.

Technically speaking, limit controls are thermostats or pressurestats. When designed for limiting service, they are listed as limit controls.

The fan on a forced air furnace may be operated

**by Edward Dowis**

*The sale, maintenance, and modernization of heating controls can mean extra dollars*

*in the pocket of the contractor or dealer engaged in year-round air conditioning work.*

continuously or intermittently. Where outside air is drawn in by the fan, it is recommended that it operate only when furnace temperature is high enough to prevent cold air being blown into the rooms. A fan control thermostat, controlled by furnace temperature, controls fan operation.

Fig. 1 is a wiring diagram of a typical forced air residential control system. Various control items are shown in usual positions. Wires are brought to a common junction box. They are enclosed in armor, such as armored cable, flexible conduit or rigid conduit. The sequence of operation can be determined by tracing the circuit, beginning at the hot (or, more properly, ungrounded) line.

Current flows through the on-off switch, room thermostat, limit control and burner in series, returning through the grounded line. Opening of either of these devices breaks the circuit and stops operation of the burner. When furnace temperature rises to the fan control setting, which closes on temperature rise, this control closes a circuit through the blower motor and puts it in operation.

#### **Variations Possible in Operation of System**

It is desirable to have a switch which can permit the fan to operate continuously. Some heating engineers favor continuous fan operation in warm air systems. It may be desirable to operate the fan during the summer to provide circulation and ventilation. This can be accomplished by placing a single pole switch parallel with the fan control thermostat as shown. Closing this switch provides continuous fan operation so long as the on-off switch is also closed.

Several variations are possible in the hookup of the various control items. It may be desirable to have the fan stop immediately when heat demand by the room thermostat is satisfied. This can be accomplished by transferring the fan controller wire shown connected to point A to point B. By transferring the continuous fan operating switch wire from point C to D, the fan switch can be made to operate the fan without regard to the on-off switch setting.

A combination warm air furnace control is available which combines the high limit and fan control functions. It also has a continuous operation fan switch. It is so constructed that the fan cut-in will always be lower than the high limit cutout. This control costs less than two separate ones and wiring is simplified, since

components contained within the combination are pre-wired.

The circuit shown in Fig. 1 requires that all components, including the fan motor, operate at the same voltage. This is usually 115 or 230 volts. Wiring to the thermostat must conform to the code for voltage used. To simplify and reduce wiring cost, part or all control wiring may be low voltage, operating current being obtained from a step-down transformer at about 20 to 24 volts. The low voltage and inherent amperage limiting features of these transformers makes low voltage control wiring possible.

#### **Circuit Using Low Voltage Components**

Fig. 2 illustrates a circuit including room thermostat, limit control and burner. The circuit through a switch or controller is said to be closed when contact is made so current can flow. In this circuit, both thermostat and limit control close when temperature rises above their settings. Warm air furnace controls are usually adjustable to about 350° with a fixed differential between close and open of 25°. Room thermostats are adjustable from about 55° to 85°. Differential may be fixed at about 2° or adjustable to 4°.

When room temperature falls below the thermostat setting, the circuit closes, permitting current to flow through the limit control and burner actuating device. This may be an oil burner or stoker motor or the valve of a gas burner, also the blower motor of the gas burner, if any. Rise of furnace temperature above a safe limit will open the circuit through the limit control and stop operation of the burner. In a similar manner, the room thermostat controls operation of the burner in response to variations in room temperature.

It is standard practice to use low voltage components and wiring for the circuit shown in Fig. 2. The solenoid valve coil or motorized valve at the burner would have to be low voltage. Where standard voltage motors or other equipment must be operated by low voltage controls and wiring, a switching relay may be used.

Relays are available with or without a built-in transformer. Fig. 3 illustrates the operation of a relay with transformer built in. The standard voltage motor is controlled by the relay contactor. This is controlled by a low voltage solenoid powered by a step-down transformer. Wires running to the room thermostat need be suitable only for low voltage. Additional con-

*Continued on next page*

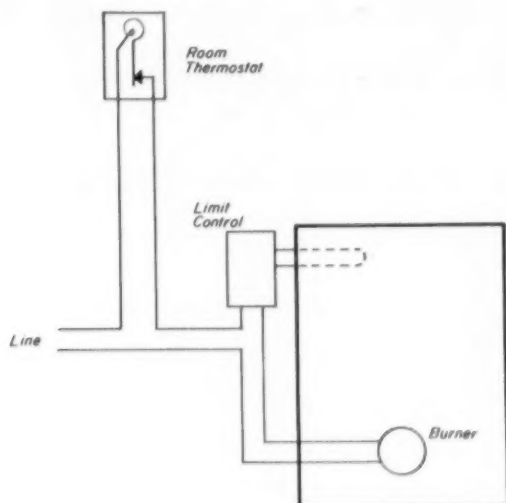


FIG. 2—Room thermostat, limit control, and burner circuit.

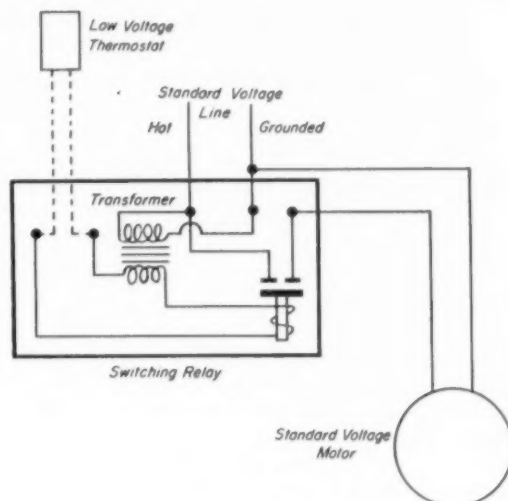


FIG. 3—Switching relay operating standard voltage motor with low voltage thermostat.

## HEATING CONTROL EQUIPMENT

trols, such as a high limit, may be connected in series.

Single or three phase motors of any size or voltage can be controlled by low voltage thermostats. This is accomplished by installing low voltage coils on the magnetic starters. Such starters may also provide overload protection to the motors.

Safe operation of gas-fired equipment by automatic control requires positive shut-off of gas to the burners in event of pilot light failure. Among the most reliable safety devices is a pilot switch, energized by a thermocouple which is heated by the pilot. Enough electricity is generated in the thermocouple by the pilot flame to energize a small electromagnet in the switch to hold it closed. The pilot switch is connected in series with the burner control circuit.

A pilot safety valve can be inserted in the main gas line to the burner. This can be held open by electricity generated by a thermocouple heated by the pilot flame. Pilot failure causes the valve to close. It can be reset manually, once the pilot flame is restored. Failure of either of these devices to permit operation of the burner is usually due to dislocation of the thermocouple in relation to the pilot flame, pilot flame not hot enough, or a thermocouple that needs replacement.

Protective devices are also required for safe automatic operation of oil burners. The supply of oil and operation of the burner must be stopped if ignition should fail or the flame go out for any reason. One

popular type includes a transformer for connecting it to a low voltage room thermostat. It stops operation of the burner and locks it out on ignition failure. If the flame goes out after being lit, the relay tries to start it once after a suitable time delay. If it again fails, it locks off until manual reset.

Use of a time delay solenoid valve is recommended in the oil line. This permits the fan to blow out gases from the combustion chamber and pressure to build up in the oil system before oil is admitted for combustion. This reduces odors, dripping of oil, smoke and carbon deposits.

Service men should be very careful not to by-pass or render ineffective any safety controls. These controls should be carefully checked and tested on each service call; and periodically, should other service not be required.

## Hookup for Hot Water System

Fig. 4 illustrates a control hookup for a hot water system with circulating pump. On call for heat, the room thermostat completes a circuit energizing a relay as illustrated in Fig. 3. This relay energizes the circulator and burner. A high limit control is connected in series with the burner line.

Two or more zones can be handled by a circulating system by installing a circulating pump in the return line from each zone. Each circulating pump should be controlled by a thermostat in the zone it serves. The pumps connect to a common manifold discharging into the boiler. Constant hot water temperature can

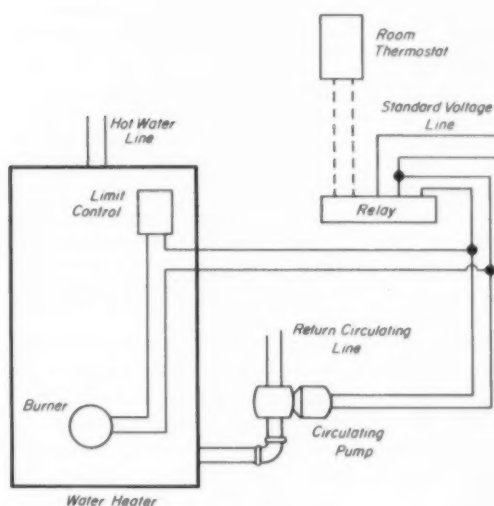


FIG. 4—Forced circulation hot water system.

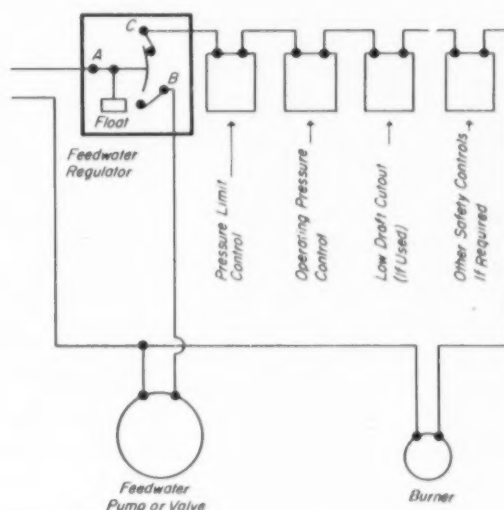


FIG. 5—Connections for steam boiler controls.

be maintained by an insertion thermostat actuated by water in the boiler. This is connected in series with line voltage and the burner.

If the thermostat and burner are for low voltage, voltage can be stepped down by a transformer. A second limiting thermostat set higher than the first is sometimes used for safety, in case the first should fail to stop the burner.

#### Hookup for Steam Boiler System

Steam heating boilers require controls which will add water when the level falls to the desired point. A low water cutout must stop operation before water falls below a safe level. A pressure controller must start, stop and regulate the burner to maintain the desired pressure. An additional high limit pressure control must stop operation before a safe limit is exceeded, over and above operating pressure. It may also be necessary to prevent the burner operating should draft conditions prevent carrying away fumes or permit accumulation of flammable or explosive gas, vapor or dust.

Fig. 5 illustrates schematically the hookup of the various components of a boiler control system. When water level falls below the desired level, contact is made between A and B of the water level regulator to start the feed pump or open a water valve. Should the level continue to fall, contact between A and C is broken and the burner stopped. Other controls are connected in series with the burner. Pilot safety controls may also be included in this series.

## MORE TO COME

**T**O meet a growing interest in year 'round air conditioning by readers, **COMMERCIAL REFRIGERATION & AIR CONDITIONING** has planned a series of articles primarily devoted to heating sales opportunities and application techniques.

This article is the second in the series. The first, "Figuring Heating Loads is Easy," appeared in our May issue.

Future articles will discuss such topics as how to design a duct system for forced air residential heating, how to lay out a hot water piping system, how to lay out a steam piping system, etc.

they are based upon the correct sizing of equipment in relation to load. In our Low Cost Comfort study we found such conditions as a 96,000 Btu furnace in a house with half that load. Thirty-six per cent of cooling units were under-sized; we often found builders planning to use 2-ton units where the load, before comfort engineering, called for 3-tons or greater capacity. Less frequently we found builders apparently anxious to "play safe" by specifying 5-ton units where 3 tons or less would serve.

(4) The most important new fact developed in our National Test Program is that the long-revered "law of diminishing returns" needs a drastic over-haul, at least when applied to building insulation. Theoretically, the first unit of insulation does the most good, and subsequent increases in insulation thickness do progressively less for the buyer. The fallacy is to think, first, that costs go up as insulation thickness is increased. It does not rise in proportion because labor is such a large factor and labor costs do not materially change with insulation thickness.

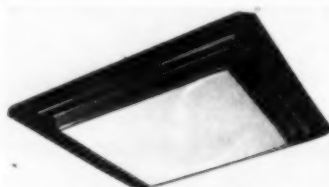
The second fallacy comes into play when equipment sizes can be reduced. A builder can save \$35 to \$50 when he drops one commercial size in heating units and around \$200 when he drops one ton in cooling capacity. When these savings are credited against the cost of comfort engineering improvements that make them possible, we usually find that it is the last inch, instead of the first inch of insulation that makes the biggest initial saving.

The break point varies with individual houses and with climates. But in general our studies show that the best results come from the maximum use of insulation.

(5) Here is another important advantage of comfort engineering to the industry: Maximum use of insulation, with some care for window shading and ventilation, will reduce the number of misfits in the installed capacities of heating

and cooling units. If 50,000 Btu output heaters and 30,000 Btu capacity cooling units can take care of 60% of your market, it is obvious that your salesmen and installation men will have less figuring to do and will give their customers satisfactory performance more frequently.

(6) This in turn suggests a design opportunity of some merit. If today you try to design a combination unit, or companion units, for heating and cooling, you face a difficult air delivery problem. Houses insulated only to FHA minimums have heating loads ranging from 1.3 to 2.5 times the heat gain. The same houses when



**TWIN-DOMED**, all-plastic skylight, being introduced by Resolite Corp., Zelienople, Pa., keeps heat in, cold out, because of its thermo-bottle-type construction. Dead air space between sealed inner and outer domes acts as insulator, reducing heating and air conditioning losses caused by conventional skylights. Cross-section drawing below shows twin domes of translucent, reinforced plastic that allow high degree of light transmission without significant heat transfer. Interior condensation also is eliminated, manufacturer says.



comfort engineered, show heating loads 2 to 3 times cooling loads. The ideal ratio is a heating load 3.4 times the cooling load so that the blower can deliver the same cfm for heating and cooling. Insulation helps reduce this design problem.

(7) While on the subject of design improvements let me suggest three others growing out of good design practices:

a) A comfort engineered house is inherently draft-free except where excessively large glass areas are used. Therefore you can simplify your distribution system with less likelihood of reducing comfort levels than with poorly insulated houses.

b) A comfort engineered house is nearly air- and vapor-tight. In winter

this means higher accumulations of domestically generated water vapor (from bathing, cooking, laundering, floor washing, etc.) and greater need for ventilation to prevent troublesome condensation. You can solve several problems if you will provide a fresh air intake in your cold air return system, adequate to make up for all air consumed in combustion plus air discharged by fans from kitchens, laundries and baths.

c) Comfort engineering practices tend to shield the modern home from outside noises, but correspondingly make indoor equipment noises more troublesome. You who can make truly quiet heating and cooling units have a lush market ahead.

(8) Comfort engineering bunches your unit capacities into smaller ranges, with more units in each group. That is the customary formula for developing production economies. But it also suggests simplified blower capacities for summer and winter air delivery. This means simplified duct systems and installations. And possibly two compressor sizes with a somewhat wider choice of condenser and motor capacities would give you a highly flexible line of cooling units at minimum production cost.

(9) Earlier I predicted that comfort engineering may be the long-missing key to potentially tremendous market for central air conditioning systems for the average home. The principal obstacles to this market in the past have, in my opinion, been these:

a) Initial installation costs have been too high or units sized so low as to perform inadequately; mostly because the estimate has been made without thought of insulating the house as a prerequisite. In consequence, bids have been based on 3-ton and 5-ton units at corresponding prices.

b) Operating costs have been too high. Some home owners using popular window units of inadequately capacity and drafty performance, have been shocked at the jumps in their electric power bills. So they erroneously conclude that a central system would be even more expensive to operate.

c) The "comfort" provided by poorly engineered air conditioning in stores, theaters, trains and some houses has been far below standard. Window units are great offenders to many persons sensitive to drafts. Our industry, in effect, has promised comfort but has only delivered mechanical gadgets of uncertain or inadequate performance.

Comfort engineering corrects these major faults and thus can open up this market if we use it wisely. It lowers initial costs, lowers operating costs, diminishes the

risks of inadequate engineering of the installation, and provides a standard of comfort that cannot possibly be achieved by any short-cut methods.

(10) Sales managers will see, I am sure, the larger markets that are inherent in lower prices, fewer models, improved features, more flexible lines and the enormous sales opportunities that await the successful opening of the huge central air conditioning market for modest houses. In this connection, I recently checked a map published in 1946 by the General Services Administration (see page 00) which was intended to guide Federal agencies with respect to the climatic areas justifying the installation of air conditioning equipment. Here is what I found.

a) In Zone A, where the effective temperature is 84 F and above, the industry built 30% of its houses in 1955.

b) In Zone B, where effective temperatures range between 80 F and 84 F builders erected 49% of these new houses.

c) In Zone C, where lower effective temperatures indicate that natural wind movement may produce sufficient comfort to make air conditioning difficult to sell, the industry built only 21% of the new houses.

That means our potential residential air conditioning market is substantially 80% of all new houses! We ought to be happy with that knowledge, but unhappy that we haven't yet made a real dent in this market.

Why is it that General Motors is said to have sold more air conditioned automobiles than its subsidiary, Frigidaire, sold residential air conditioning units last year? Why will people pay \$300 to \$800 to cool their automobile before they they will invest as much in a cool home? The car unit must be paid off in three years; the home unit can be financed over a 20-year life if accepted as part of the house. Why will people buy higher priced cars with automatic windows, seats, transmissions and headlights before they will upgrade their homes?

Partly, I think, because of the high salesmanship of the automotive industry. And partly, I believe, because these higher priced cars with their convenience gadgets give people something more than just what they need. They are quieter, more luxurious, more

powerful, smoother in operation, more colorful, more beautiful. Owners take great pride in them.

Surely all of us in the heating and air conditioning industry can do as well. We can sell better. We can upgrade our products and increase their use. We can offer better performance, better comfort, better "mileage per gallon" or lower operating costs by working together. We can do lots of things once we stop cutting down on quality to get a competitive price and start improving performance to earn a higher price.

The opportunities ahead for the whole heating and air conditioning industry are immense. Product-wise, residential insulation materials, heating and air conditioning units, control equipment and other components are well designed and made.

But market-wise we have as much potential growth ahead of us as the automobile industry had when the Model A Ford displaced its predecessor. Before World War II, builders spent 12% of their house cost on heating; today they spend only 3% to 4% of the cost for such products. Other people are getting the dollars we used to get.

Whatever the fuel or source of heat, there is an inevitable partnership with insulation. Those who do not see the whole picture often think that the two segments of industry are antipathetic; that one robs the other of business.

I have tried to show you that this is no so. Comfort engineering can be used to sell more heating and more residential air conditioning at more profit to your industry while it sells more insulation and more comfort and more economy. It truly benefits everyone, hurts no one. I hope you will make comfort engineering your greatest sales tool for a profitable future.

#### NAMED BY FLEXONICS

Yaco, S. A., Buenos Aires, a leading South American hose manufacturer, has been licensed by Flexonics Corp., to manufacture synthetic and plastic hose assemblies under the Flex-O-Tube trade mark, brand name of Flexonics' nonmetallic hose products.

#### ROOM COOLERS . . .

*Continued from page 87*

The floor actually is in use only when customers specifically interested in office furniture desire to be shown the displays. Consequently, since there is relatively little activity on this floor in comparison with the retail office supply department below, the cool air tends to remain fairly stable because of the low occupancy load. Illumination load, too, is low in this area, since the lights are never on except when the showroom is in actual use.

"Formerly," Hayes reports, "during hot weather spells our salesmen would bring their customers down from the second floor display room wringing wet. Now, thanks to the window air conditioning units, the prospect can sit down and relax in comfort at the desk in which he is interested."

"Under these conditions, the salesman can present the features of the equipment in detail. The customer is in a mood to listen to the full sales story, instead of picking out a selection of furniture that comes reasonably close to meeting his requirements and then hurrying down from the sweltering display level to the air conditioned comfort of the firm's main floor area. The result has been a marked upswing in the sales and profits of our office furniture department."

#### COOLING CAPACITIES UP FOR GE ROOM MODELS

Cooling capacity of all its 1957 Thinline room air conditioners has proved to be substantially higher than specified in published specifications sheets and other literature, including consumer advertising, General Electric Co. announces. Increases range from 100 to 650 Btuh for the different models.

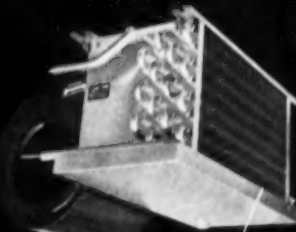
New figures are based upon a series of tests of production models.

The previous, published figures were based upon tests of pre-production models. Both series of tests were conducted in accordance with ARI Standard 110-56.

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## USEFUL LITERATURE On Air Conditioning

To obtain the information described below, simply circle on the postcard in this issue the key numbers of the items you wish to receive. We will forward your requests to the companies concerned.

**HINTS ON CORROSION** and scale prevention are given in three-color literature sheet on the treatment of water in air conditioning systems published by Water Service Laboratories, Inc., New York. Other subjects covered pertain to problems in chilled water circulating systems, refrigerating plants, and control of chemical treatment. Publication announces that a free survey and report on the operating conditions at any air conditioning or refrigerating plant will be made gladly with a report being sent to the owner or management without obligation.

Circle No. 137 on Reader Service Card

**COLORFUL FOLDER** from Thermo-Products, Inc., North Judson, Ind., discusses summer air conditioning. Photographs show all models which are designed for adaptation to basement, hi-boy, counterflow, and horizontal furnaces. Literature includes specification data of each model.

Circle No. 138 on Reader Service Card

**COMPREHENSIVE, INDEXED** Bulletin No. C-1100-898 P studies multi-zone air conditioning units manufactured by Worthington Corp., Harrison, N. J. Graphically illustrated on 36 pages, publication contains specification and physical data on component parts; engineering and design features; direct expansion cooling coil data and ratings; sample problem tables for chilled water cooling coils and hot water heating coils; and curved charts showing water velocity, coil capacity factors, base temperature, and water friction for cooling and heating coils.

Circle No. 139 on Reader Service Card

**TWO PRODUCT CATALOGS** are obtainable from Airtemp Div., Chrysler Corp., Dayton, Ohio. Form AC-233 is a 2-color, 16-page catalog on packaged liquid chillers. Form AC-249 (38 pages) illustrates and contains feature and specification information on the firm's 10 to 125-hp line of radial compressors.

Circle No. 140 on Reader Service Card

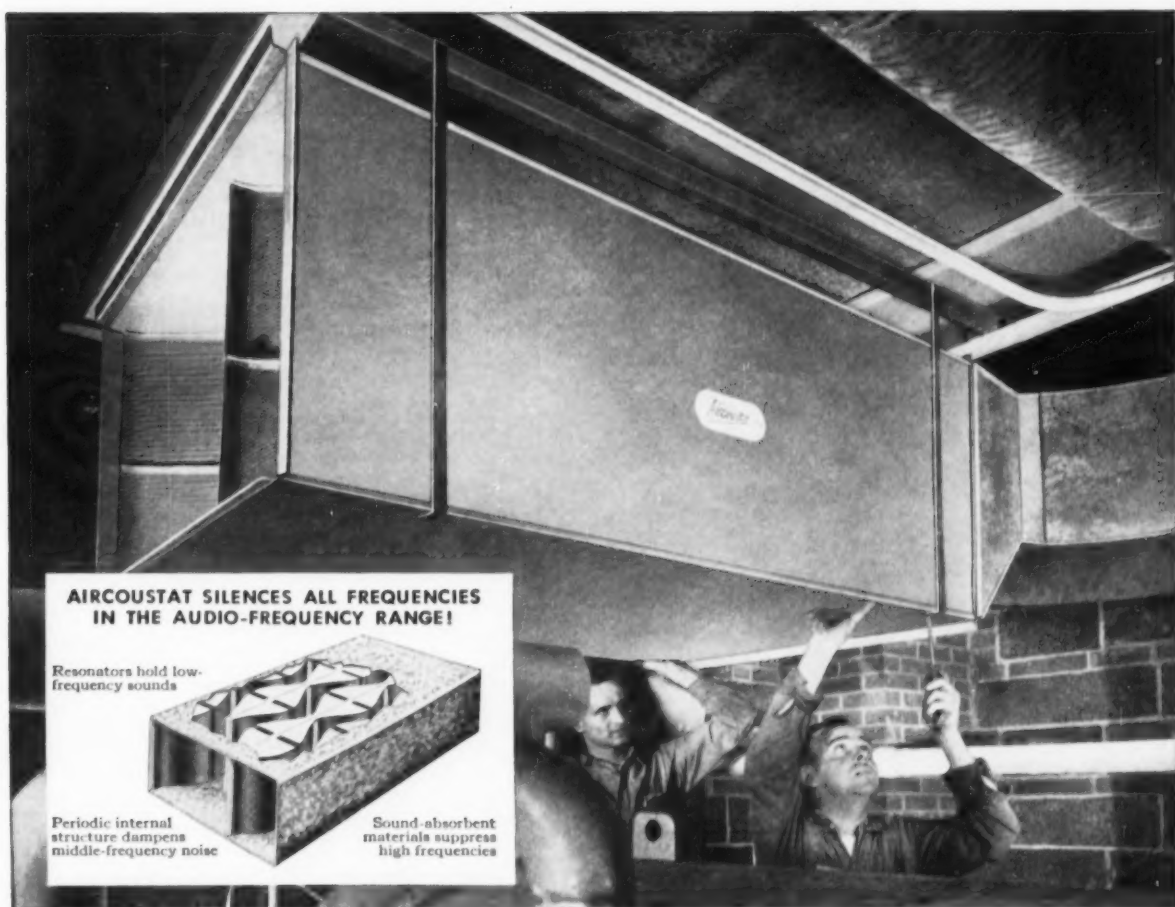
**ESSENTIAL REQUIREMENTS** for perimeter insulation are examined in four-page bulletin produced by United States Mineral Wool Co., Stanhope, N. J. Detailed insulation data is accompanied by illustrations. General construction recommendations are listed.

Circle No. 141 on Reader Service Card

**COST REDUCTION** of air conditioned houses is explained in a mineral wool insulation study available from National Mineral Wool Association, New York, N. Y. Prepared data by Professor John R. Watt, University of Texas, examines the practical reduction of construction costs obtained by application of thick mineral wool insulation rather than minimum amount required by FHA.

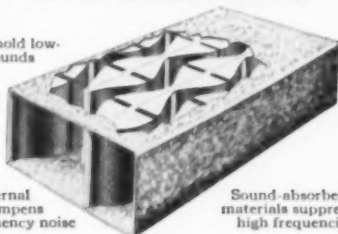
Circle No. 142 on Reader Service Card

(More Air Conditioning Literature on page 100)



**AIRCOUSTAT SILENCES ALL FREQUENCIES  
IN THE AUDIO-FREQUENCY RANGE!**

Resonators hold low-frequency sounds



Periodic internal structure dampens middle-frequency noise

Sound-absorbent materials suppress high frequencies

## **AIRCOUSTAT\* Sound Traps eliminate air conditioning noise at 50% less cost**

**Acoustical Performance Guaranteed. Easy to Install. Pre-Engineered—No Design or Layout Headaches.**

Revolutionary AIRCOUSTAT Sound Traps for low-velocity air conditioning systems reduce labor, materials and storage costs. Deliver guaranteed noise control efficiency.

You don't need special tools for installation. Since one 5-foot AIRCOUSTAT does the job of 80 feet of ordinary duct lining, you have less to install. Fitting AIRCOUSTAT units is easy since they fit any shape of duct . . . and are not dependent upon the size of the duct cross-section. Pre-engineering saves design and layout time because AIRCOUSTATS don't have to be individually designed for each particular

duct in the system. AIRCOUSTAT simplifies your storage problems and lets you get materials on the job early. In-shop lining of duct is eliminated—you can ship your ducts nested together and store them outside on the job site.

Discover how AIRCOUSTAT Sound Traps can save you time and money . . . create greater customer satisfaction.

*\*Koppers Trademark*



**INDUSTRIAL  
SOUND CONTROL**

**Engineered Products Sold with Service**

### **MAIL THIS COUPON TODAY**

KOPPERS COMPANY, INC., Metal Products Div., Industrial Sound Control Dept., 7707 Scott St., Baltimore 3, Md.  
Gentlemen: Please send me a free copy of your booklet on AIRCOUSTAT Sound Traps.

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....



The Low Noise Levels Necessary for World-Wide  
Broadcasting at the Voice of America are provided by



## Quiet Duct PACKAGED STANDARDIZED SILENCING

Yes, the new IAC Quiet-DUCTS eliminate noise from air conditioning and ventilating systems to meet every performance requirement! Prefabricated in as many as 148 sizes, these economical "Quiet-DUCT" units which measure in length from 2 to 10 feet provide as much noise control as a conventional lined duct measuring from 30 to 100 feet long!

**COMPLETE DATA AVAILABLE!** Write today for a complete set of data sheets and catalog describing prefabricated "Quiet-DUCT" units.

### INDUSTRIAL ACOUSTICS COMPANY, INC.

*Specialists in Noise & Pulsation Control*

341 Jackson Avenue, New York 24, N.Y. • Tel: CYpress 2-0180

Circle No. 75 on Reader Service Card

### AIR CONDITIONING LITERATURE . . .

*Continued from page 98*

**GRAPHIC ILLUSTRATIONS** of its entire line of air conditioning units are given in 32-page Catalog (54C7c) published by Re-cold Corp., Los Angeles. Details on construction, typical specifications, arrangements available, and shipping weights are included. The firm's full line of accessories also is discussed.

Circle No. 143 on Reader Service Card

**PRACTICAL ILLUSTRATIONS** dramatize how various types of flexible duct connectors can be made in two-color brochure by Elgen Mfg. Corp., Long Island City, N. Y. Numerous features of product are examined. Special specification sheet may be cut from brochure and kept for future reference.

Circle No. 144 on Reader Service Card

**RECOMMENDED OUTLINE** for writing engineering specifications when ordering packaged air conditioners is included in Bulletin 6125 from American Blower Div. of American Standard, Detroit, Mich. Designed features are detailed and illustrated, and such operating components as cooling coils, fan, fan motor, compressor, condenser and controls are discussed thoroughly. Complete physical data for the units and all major components are given for each of the models in the line.

Circle No. 145 on Reader Service Card

**EASY-TO-READ** dimensional drawings and tables are shown in comprehensive Catalog GN-57 obtainable from Reznor Mfg. Co., Mercer, Pa., depicting its line of gas-fired commercial and industrial heating equipment. Ideas are also offered for installations and applications.

Circle No. 146 on Reader Service Card

**PRECISE TUBE ROLLING** is the theme of Bulletin 56-1 which is used to describe the new air-powered, boiler-tube expander drive and control manufactured by Thomas C. Wilson, Inc., Long Island City, N. Y. Enumerated are the outstanding features of the new device.

Circle No. 147 on Reader Service Card

**LOAD-CALCULATING NOMOGRAPH** to help estimators and project engineers figure cooling requirements for electronic equipment is available from Ellis & Watts Products, Inc., Cincinnati, Ohio. Nomograph will provide required cooling load in Btu's per hour when type and size of structure, internal load, operating temperature and occupancy are selected. Will select correct capacity for air conditioning equipment designed to meet rigid military specifications.

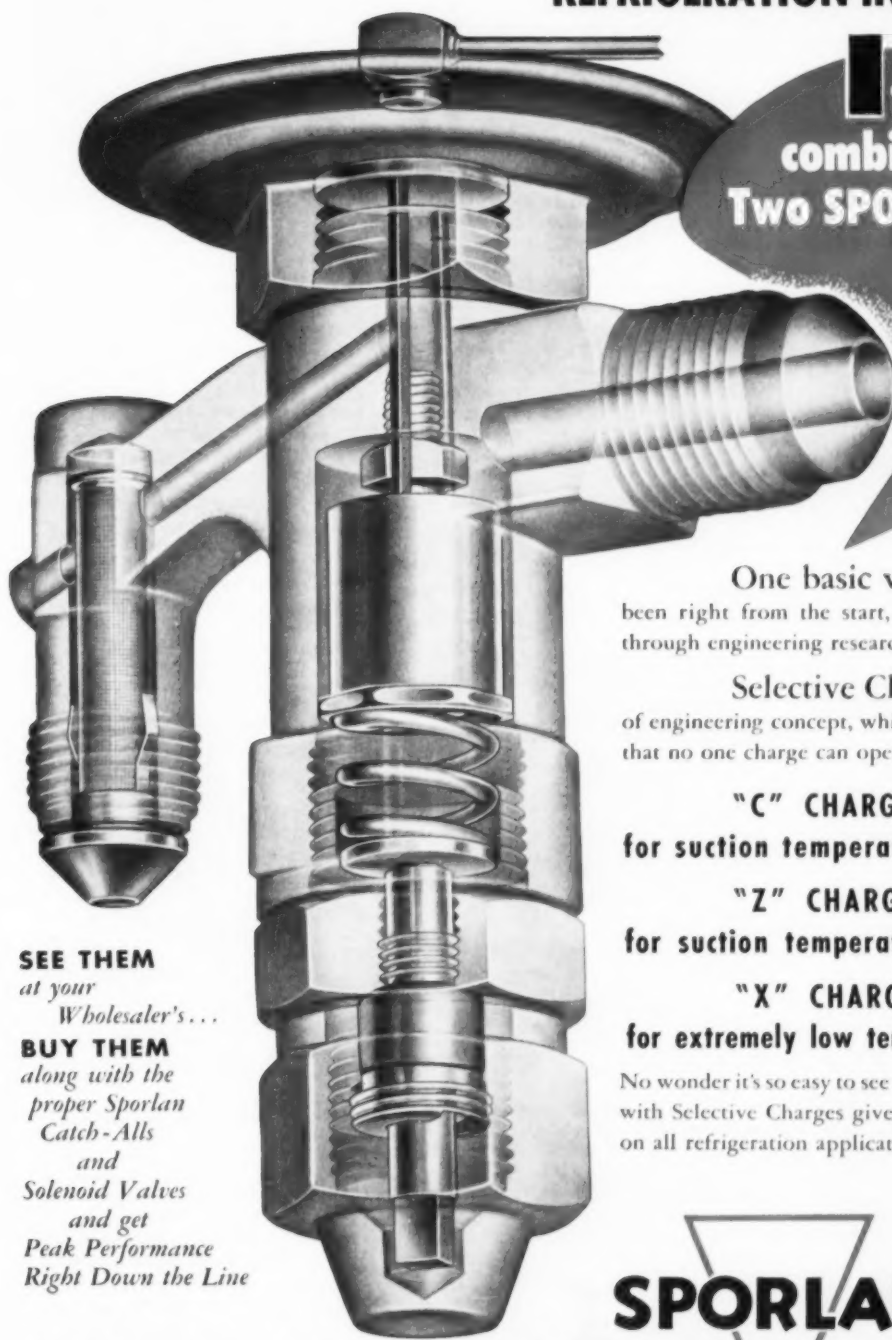
Circle No. 148 on Reader Service Card

**DESCRIPTIVE LITERATURE** concerning cooling tower line, designated WMT series, is available from Drayer-Hanson, Div. cerned with selection of equipment that is rated for use with of National-U.S. Radiator Corp., Los Angeles, for those company type of refrigeration equipment, or for any process in which water must be cooled. Table of dimensions covers 13 standard models (cfm range 1500-245000), which is keyed to visual diagrams of unit arrangements. Quick-step selection procedure, charts detailing nominal capacity tons refrigeration and other simplified data round out publication C-H 5625.

Circle No. 149 on Reader Service Card

*(Turn to page 57 for more Useful Literature)*

# *It's so Easy to See Why* **SPORLAN G VALVES** with **SELECTIVE CHARGES** give **PEAK PERFORMANCE** on **ALL** **REFRIGERATION INSTALLATIONS**



**It's the  
combination of  
Two SPORLAN Firsts  
that date  
back to  
1934**

One basic valve design that has been right from the start, plus constant refinement through engineering research.

Selective Charges, then an unheard of engineering concept, which today keep on proving that no one charge can operate on all applications.

## **"C" CHARGE**

for suction temperatures **ABOVE ZERO**

## **"Z" CHARGE**

for suction temperatures **BELOW ZERO**

## **"X" CHARGE**

for **extremely low temperatures**

No wonder it's so easy to see why SPORLAN G-Valves with Selective Charges give **PEAK PERFORMANCE** on all refrigeration applications . . . they always have!

### **SEE THEM**

*at your*

*Wholesaler's . . .*

### **BUY THEM**

*along with the  
proper Sporlan*

*Catch-Alls*

*and*

*Solenoid Valves*

*and get*

*Peak Performance*

*Right Down the Line*

## **SPORLAN VALVE COMPANY**

7525 SUSSEX AVENUE • ST. LOUIS 17, MISSOURI



EXPORT DEPT.  
AD. AURIEMA INC.,  
89 BROAD ST., NEW YORK 4, N. Y.

# WHAT'S NEW

## in Air Conditioning Equipment

For further information on any of these products, simply circle on the postcard provided in this issue the key numbers of the items in which you are interested. Your request will be forwarded directly to the companies concerned.

(For more New Products turn to page 60)

### Highboy Furnace

**Product:** Residential highboy furnace.

**Manufacturer:** Worthington Corp., Harrison, N. J.

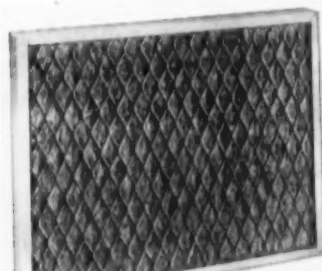


**Features:** Available in 80,000, 100,000, and 150,000 Btu input sizes. Two-tone beige and cream. High static blowers designed for installation where air conditioning is going to be tied in with heating unit. Either gas or oil-fired models.

Circle No. 171 on Reader Service Card

### Dry-Type Filter

**Product:** "A-lum-O-Aire" permanent, dry-type filters for all do-



mestic, commercial, and industrial air-cleaning requirements.

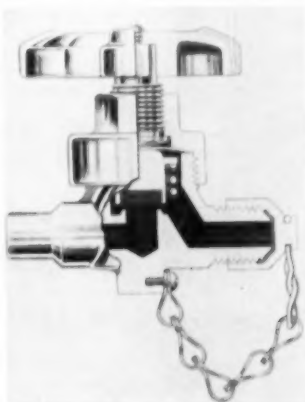
**Manufacturer:** Carey Electronic Engineering Co., Springfield, Ohio.

**Features:** With aluminum-wool media, catches and holds dust, dirt, and lint particles, without use of oils or adhesives. Rustproof, fireproof, and highly resistant to chemicals or adverse atmospheric conditions. To clean, vacuum or flush with water and replace. Significant decrease in maintenance and replacement costs, manufacturer says. Available in standard or specially-engineered sizes, and thicknesses of 1/2, 1, and 2".

Circle No. 172 on Reader Service Card

### Drain Valve

**Product:** Charge, purge, and drain valve ("Kerojet") for refrigeration and air conditioning systems.



**Manufacturer:** Ketrotest Mfg. Co., Pittsburgh, Pa.

**Features:** Full open height of only 2 1/4". Forged brass body with integral mounting flange, beryllium copper, and stainless steel diaphragms. Maximum operating pressure 500 psi. Maximum temperature 200 F. Connection size 3/8" o.d.s. inlet — 3/8" male flare outlet.

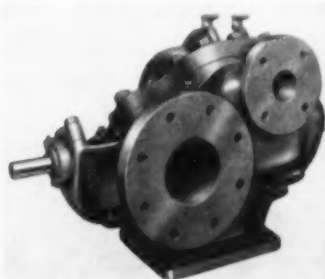
Circle No. 173 on Reader Service Card

### Centrifugal Pump

**Product:** Line of diagonally-split case centrifugal pumps for variety of applications.

**Manufacturer:** Aurora Pump Div., New York Air Brake Co., Aurora, Ill.

**Features:** Can remove entire rotating element without disturbing piping or pump-motor-base align-



ment. 45-degree split allows both suction and discharge to be in bottom half of casing but above center line of pump. Self-venting. Will not vapor lock thus eliminating need for bleeding back to feed water heater or receiver. Large suction areas. Available in water-cooled stuffing box and water-cooled bearing construction when required. Iron or stainless steel trim for high temperature conditions.

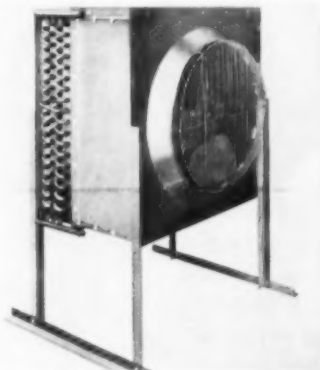
Circle No. 174 on Reader Service Card

### Air-Cooled Condenser

**Product:** "Dricon" air-cooled condenser.

**Manufacturer:** Recold Corp., Los Angeles, Calif.

**Features:** Balanced circuiting



promotes efficiency of condenser coil, manufacturer says. Adjustable angle iron stand. Large, slow-speed, belt-driven fans. Galvanized housing. Copper tube aluminum fin coils. Strong fan guard. Precision ground shaft. Self-aligning ball bearings. Motor located inside unit for weather protection.

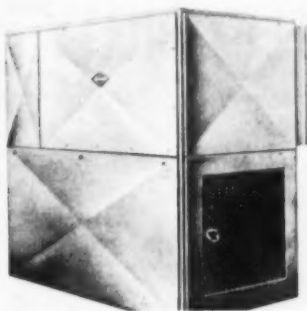
Circle No. 175 on Reader Service Card

### Packaged Conditioner

**Product:** SCR line of packaged, self-contained, water-cooled air con-

ditioners with water-cooled condensers.

**Manufacturer:** Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.



**Features:** Comprised of 7½, 10, 15, 22½, 30, 50, and 60-hp models. From 3000 to 2400 cfm range. Four models are multiple circuit; three are single compressors. Sectional construction permits remote location of condenser section. Full-sized copper tube, aluminum fin coils in compressor section. Blowers are balanced statically and dynamically.

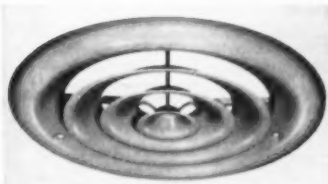
Circle No. 176 on Reader Service Card

#### Ceiling Diffuser

**Product:** Large-capacity, wide-ring, ceiling diffuser.

**Manufacturer:** Air Control Products, Inc., Coopersville, Mich.

**Features:** Consists of series of wide, concentric rings in air-foil de-



sign. Anti-smudge outer ring designed to eliminate virtually all turbulence-caused smudging. Special adapter fittings not needed. Satin beige prime coat. Equipped with self-sealing gasket applied at most efficient point—where diffuser meets duct. Push-pull, rod-operated damper with butterfly valve. Flush and step-down diffusers and dampers are available in 6, 8, 10, 12, and 14" sizes.

Circle No. 177 on Reader Service Card

#### Air Filter

**Product:** New series of absolute-type air filters.

**Manufacturer:** Farr Co., El Segundo, Calif.

**Features:** Give virtually 100% air cleaning efficiency in most critical sub-micron ranges, manufacturer says, and remove dust particles as

small as 0.1 micron in diameter. Individual capacities from 30 to 5000 cfm. Deep, closely-spaced folds of filter paper are fitted into rigid rectangular frame. Paper pleats are held securely in place by corrugated separators which permit easy passage of air.

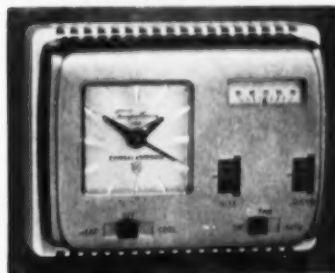
Circle No. 178 on Reader Service Card

#### Automatic Thermostat

**Product:** "Tempotherm" 365 thermostat which offers automatic clock thermostat control of both heating and cooling functions with automatic night setback and morn-

ing pickup for each.

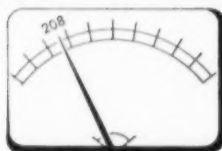
**Manufacturer:** General Controls Co., Glendale, Calif.



**Features:** Lowered night setback on the cooling side permits

## WHEN LINE VOLTAGE MEASURES

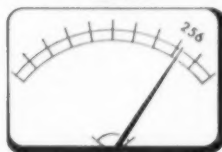
BELOW



NORMAL

OR

ABOVE



NORMAL

## YOU NEED AN Acme Electric Boost and Buck Transformer

Air conditioning equipment cannot function properly if connected to an electrical circuit that is substantially below or in excess of the voltage of the motors. A one-ton unit with a motor designed for 230 volt operation should not be connected to a 208 volt circuit with the expectation that it will operate properly. When motor lacks sufficient torque, runs more than a few seconds on starting winding, overheats, or cycles off-and-on, check the voltage and install the proper size Acme Electric Boost and Buck transformer to correct the trouble.



Easily installed at the point of use, Acme Electric Boost and Buck transformers can be interconnected to correct a low voltage condition or a condition of excessive voltage supply. They're compact, inexpensive.

Write for Boost and Buck transformer catalog.

**ACME ELECTRIC CORP.**

827 WATER STREET  
CUBA, N. Y.

**Acme Electric**  
TRANSFORMERS

Circle No. 77 on Reader Service Card

# Here's Why

## Dunham-Bush 'CR' Year 'Round Room Air Conditioners provide MAXIMUM FLEXIBILITY



'CRV' Console Unit

### FLEXIBILITY...in choice of Construction

That's the keynote of the Dunham-Bush line of 'CR' year 'round room air conditioners. Typical of the variations available: cabinet or recessed models; vertical or horizontal models; combination water cooling and heating coils; combination direct expansion and steam coils; three control kits.

### FLEXIBILITY...in Selection

| Model             | CFM<br>Normal<br>Speed | Water Coil Capacities |                   | Inner-Fin Direct<br>Expansion Combi-<br>nation Steam Coil |                   |
|-------------------|------------------------|-----------------------|-------------------|---|-------------------|
|                   |                        | Cooling<br>BTU/hr     | Heating<br>BTU/hr | Cooling<br>BTU/hr   | Heating<br>BTU/hr |
| CRV-220 & CRH-220 | 220                    | 5,600                 | 18,300            | 6,400   | 15,300            |
| CRV-330 & CRH-330 | 330                    | 8,400                 | 25,400            | 9,800   | 21,500            |
| CRV-450 & CRH-450 | 450                    | 13,200                | 35,300            | 14,900  | 28,000            |
| CRV-600 & CRH-600 | 600                    | 21,000                | 55,000            | 23,200  | 45,300            |

Cooling capacities (total heat) based on entering air 80° DB, 67° WB, 45° water (or 40° suction).

Heating capacities based on entering air 60°, 2 psig steam.

### FLEXIBILITY...in Installation

Vertical models with cabinet can be exposed or semi-recessed, basic units completely recessed. Horizontal units with cabinet can be ceiling suspended in conditioned space; basic units can be utilized for unexposed installation.

Contact your nearest DUNHAM-BUSH Sales Engineer for complete specifications or write for 'CR' catalog.



'CRH' Basic Unit



'CRH' With Cabinet



'CRV' Basic Unit

## Dunham-Bush, Inc.

WEST HARTFORD 10 • CONNECTICUT • U. S. A.

## DUNHAM-BUSH

MARSHALLTOWN, IOWA • MICHIGAN CITY, INDIANA • RIVERSIDE, CALIF. • TORONTO, CANADA • LONDON, ENGLAND • SUBSIDIARY: HEAT-X, INC., BREWSTER, N. Y.

AIR CONDITIONING • REFRIGERATION • HEATING • PRODUCTS AND ACCESSORIES

Circle No. 78 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

better humidity control and helps to offset the load of maximum daytime temperature by storing cooling capacity with resultant unit operating economy. All dials and switches on front are designed to protect walls and woodwork from finger smudge. Satin stainless steel case. Adapts readily to most standard heating and cooling air conditioning systems.

Circle No. 179 on Reader Service Card

#### Condenser For Car Unit

**Product:** All-aluminum, metallurgically-bonded condenser for automotive air conditioners.



**Manufacturer:** Modine Mfg. Co., Racine, Wis.

**Features:** Weighs less than 7 lbs. Aluminum tubing and fins. Overall depth of coil approximately 1". "Serpentine" design provides for minimum resistance to air flow, combined with high condensing capacity, manufacturer says. Simplified connections permit easy installation.

Circle No. 180 on Reader Service Card

#### Water-Cooled Package

**Product:** Self-contained, 20-hp. water-cooled, packaged, commercial and industrial air conditioners.

**Manufacturer:** Carrier Corp., Syracuse, N.Y.

**Features:** Compact filter frame. Uses high velocity filters which easily are removed for cleaning. Convenient opening to which outside air duct can be connected without taking up additional floor space. Prewired electrical center designed to save installation time and money by grouping controls in convenient location. Remote thermostat or cooling tower pump can be connected simply at terminal block provided. Two compressors. Triple valves. Sloped cooling coil exposes maximum surface to air flow, producing peak cooling and de-humidification. Quiet fans have ample power to move large volumes of air through extensive ductwork, manufacturer says. High-low, cut-out switches for each refrigeration system halts com-

pressors automatically under normal conditions.

Circle No. 181 on Reader Service Card

#### Cold-Water Conditioner

**Product:** Home air conditioner operating on cold city water or well water.

**Manufacturer:** Hastings Air Control Co., Omaha, Neb.

**Features:** Unit consists of all-

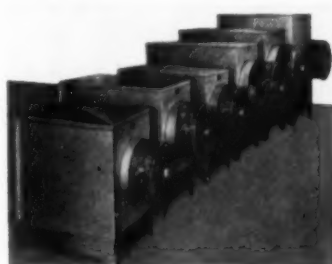


copper water coil, cabinet, humidity pan and filter section. Attaches to any furnace, requires no electrical connections. Furnace fan draws air through coil for cooling and dehumidification, then distributes it to house through existing ducts and registers. Manufacturer says five-room house can be air conditioned for about \$350, since no compressor is required. Cost of water and power for furnace blower should average \$25 to \$30 for cooling season, company says. Unit is described in booklet PW-2, available from company.

Circle No. 182 on Reader Service Card

#### Cooling Tower

**Product:** "Summer Shower" cooling tower.



**Manufacturer:** Silvercraft, Inc., Louisville, Ky.

**Features:** Electric motor mounted behind fan at very end of cooling cycle, rather than between fan and wet-deck cartridge. Motor more accessible for lubrication and maintenance. Motor does not interfere with air draft. Pulls powerful draft

of air which is broken up by inlet screen for even distribution throughout corrugated and perforated wet-deck cartridge. Up to 40 tons cooling capacity.

Circle No. 183 on Reader Service Card

#### Automobile Conditioner

**Product:** Line of automobile air conditioners.

**Manufacturer:** Clardy Automobile Air Conditioning Co., Fort Worth, Tex.



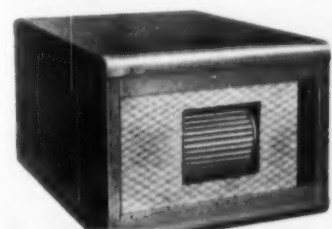
**Features:** Mount under dash and in trunk. Push button controls for instant selection of proper cooling. Automatic clutch for constant temperature. Three-speed squirrel cage blowers that can be set for constant speed or thermostatic control.

Circle No. 184 on Reader Service Card

#### Split-System Conditioner

**Product:** Addition to commercial line of three and five-ton split-system air conditioner.

**Manufacturer:** Philco Corp., Philadelphia, Pa.



**Features:** Includes evaporator blower (shown), horizontal coils and "A"-type coils. Two systems adaptable to installation in up-flow and down-flow heaters. Installation in attic or crawl space with independent air distribution systems. Condensing unit can be located outside building or home.

Circle No. 185 on Reader Service Card

#### Cooling Tower

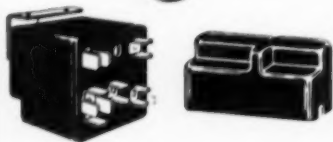
**Product:** Series of "Flow-Mizer" cooling towers with lightweight, plastic pack.

**Manufacturer:** Acme Indus-

Circle No. 80 on Reader Service Card

## Refrigeration and Air Conditioning RELAYS

GENERAL  ELECTRIC



HOT WIRE



KLIXON

Request our catalog sheets.

Your Relay Source...

**SAM HAMMER INC.**

698 WASHINGTON AVENUE  
BROOKLYN 38, NEW YORK  
SOLD ONLY THRU JOBBERS

tries, Inc., Jackson, Mich.

**Features:** Capacities range from 20 through 200 tons. Chemically inert plastic eliminates rust and corrosion, according to manufacturer.



Sheets are held in file drawer mounting which easily slide out and removed from tower for inspection and cleaning. Saves up to 90% of weight of steel packs. Plastic pack weighs 180 lbs. Hot-dip galvanized after fabrication. Water treatment is made easy with external sump.

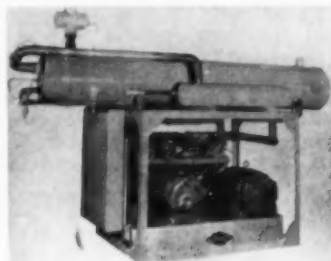
Circle No. 186 on Reader Service Card

### Water Chiller

**Product:** Model CWG water chiller designed for all types of commercial and industrial air con-

ditioning installations.

**Manufacturer:** Unarco Air Conditioning Products, National-U.S.



Radiator Corp., Johnstown, Pa.

**Features:** Permits summer cooling to be piped through a building by means of existing piping. Requires minimum of connections to put it into operation. Equipped with across-the-line starters, insulated heat exchanger and chiller, and freeze-up prevention thermostat. Available in sizes from 7½ to 75 hp.

Circle No. 187 on Reader Service Card

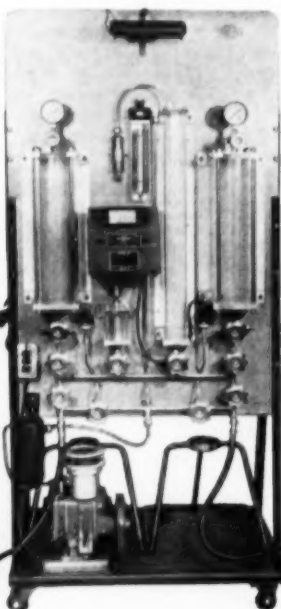
### Forced Draft Heater

**Product:** Forced draft oil heater, ("Superflame" 11-CDH).

**Manufacturer:** Queen Stove Works, Inc., Albert Lea, Minn.

**Features:** Designed to provide efficient combustion under even poor

PLAY IT



USE A CHARGING STATION THAT'S ESPECIALLY DESIGNED FOR AUTOMOTIVE AIR CONDITIONING



The AIRSERCO Charging and Testing Station No. 4 simplifies dehydrating, testing & charging of automotive freon systems.

It quickly permits:

- Proper dehydration
- Precision visual charging
- Rapid leak detection
- Easy portability

This system will service two units at the same time.



Send now for our new 1957 Refrigerant Handling & Measuring Equipment Catalog No. R-7. No charge.

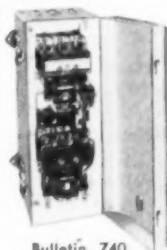
**AIRSERCO MANUFACTURING CO., INC. PITTSBURGH 13, PENNSYLVANIA, U.S.A.**

Airserco has built more refrigeration testing equipment than any other company in the world.

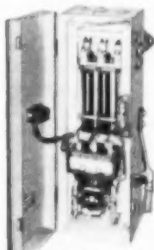
Circle No. 79 on Reader Service Card



THE SIGN OF QUALITY MOTOR CONTROL



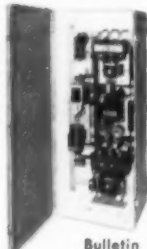
Bulletin 740  
automatic resistance starter.



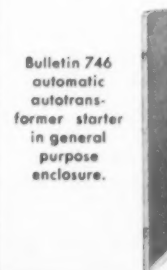
Bulletin 640  
manual resistance starter.



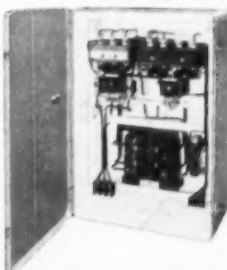
Bulletin 646  
manual autotransformer starter.



Bulletin 742  
automatic resistance starter.



Bulletin 746  
automatic autotransformer starter in general purpose enclosure.



Bulletin 736 part-winding starter on large York compressor

## GRIPES about lamp flicker cured with these A-B reduced voltage starters

High starting current inrush—the cause of "lamp flicker"—can be brought down to the power company's limitations with one of the Allen-Bradley starters shown on this page.

Bulletin 640 manual velvet smooth compression resistance starters provide stepless acceleration of the motor from standstill to full speed without lamp flicker.

Bulletin 740 automatic 2-step compression resistance starter . . . the automatic equivalent of Bulletin 640 manual starter.

Bulletin 742, the ideal automatic starter for increasing starting current steplessly, thus eliminating "lamp flicker" on network systems.

Bulletin 646 is a manually operated autotransformer type starter with either 2 or 3 reduced voltage taps.

Bulletin 746 automatic equivalent of Bulletin 646 manual starter. Rated up to 300 hp, 220 v; 600 hp, 440-550 v.

Bulletin 736 part-winding starter, shown above, can be used with squirrel cage motors having two separate parallel stator windings. Where starting current comes within power company's limitation, the result is a satisfactory, low cost installation.

When you have difficulty in deciding which starter to use, an Allen-Bradley sales engineer will gladly help you with your problem. Please call our nearest office.

Allen-Bradley Co.

1340 S. Second St., Milwaukee 4, Wis.

In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

# ALLEN-BRADLEY

SOLENOID MOTOR CONTROL



# AUTO-LITE

for  
**EYE  
LEVEL  
READING**



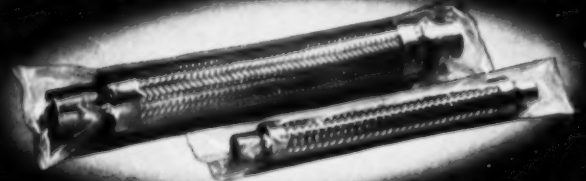
Auto-Lite Temperature Indicators are ideal for use in processing and storage rooms, and for installation on equipment where temperature indication is desirable.

Model F-1 (illustrated) is available with maximum visibility dial; choice of temperature ranges from minus 60°F to plus 750°F; flexible tubing for remote reading or rigid stem for direct mounting. Adjustable electrical alarm contacts slightly higher. From \$23.50. Send for new catalog describing Auto-Lite Temperature Indicators and Recorders.

THE ELECTRIC AUTO-LITE COMPANY  
INSTRUMENT AND GAUGE DIVISION  
TOLEDO 1, OHIO  
NEW YORK • CHICAGO • SARNIA, ONTARIO

## TEMPERATURE INDICATORS AND RECORDERS

# FLEXON VIBRA-SORBERS®



**CLEAN ... INSIDE AND OUT!**

**NOW AVAILABLE  
FROM FLEXONICS**

Flex-O-Tube synthetic Freon-resistant hose for refrigeration and air conditioning service. Also, flexible metal connectors for circulating pumps. Write for information.

Here's positive protection against the introduction of dirt and foreign matter into refrigeration and air conditioning systems. Flexon Vibra-Sorbers, come to you clean in sealed polyethylene bags.

Prior to this operation, Vibra-Sorbers are bathed in solvents, pickled, multiple washed and dried in infra-red dryers. For trouble-free installations use Flexon Vibra-Sorbers, the preferred way to isolate vibration in compressor piping. U.L. listed in sizes  $\frac{3}{16}$ " through  $1\frac{1}{2}$ " for both high and low side service. Standard sizes to 8' available. Write for Bulletin 139, today.

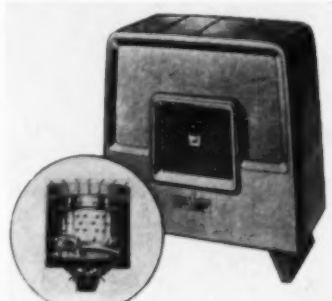


**Flexonics Corporation**  
1321 S. Third Avenue  
Maywood, Illinois

Manufacturers of flexible metal hose and conduit, expansion joints, metallic bellows and assemblies of these components.  
In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

Circle No. 83 on Reader Service Card

chimney conditions, and effective forced circulation with on-the-floor heat. Rated at 61,000 Btu/h. Stainless steel burner (inset) engineered to burn efficiently at every stage of combustion. Motor snaps out for easy



cleaning accessibility. Built-in stainless steel doghouse pilot. Blower pushes heat through diffusing vanes at radiant front, and forces heated air downward to floor. Moves heat as far as 12' in front of unit, manufacturer says. Complete electrical thermostat controls. Limit controls operate both blowers when thermostat calls for heat. Operates manually in case of power failure.

Circle No. 188 on Reader Service Card

### Air Conditioner Stand

**Product:** Roll-a-bout stand for room air conditioners for shifting of unit where conditioned air is desired.

**Manufacturer:** Admiral Corp., Chicago, Ill.



**Features:** Can be used in apartments where tenants are not permitted to install units permanently. Built of steel with tubular legs. Rolls on ball bearing casters. Can be cranked from 24 to 30" from floor to match any normal sill height. Contains adjustable vinyl fold side panels, permitting unit to be used in double-hung windows 28 to 42" wide. Eliminates window washing problem.

Circle No. 189 on Reader Service Card

## PROBLEM ENGINEERING . . .

*Continued from page 51*

reach-in stainless steel doors.

Immediately behind the shelving is 50 x 8' of refrigerated storage space which will permit the store to meet up to three days of crushingly heavy volume without running out of dairy products. The produce walk-in and the frozen foods storage box are built at opposite ends of the concrete block enclosure which is insulated throughout with 4" of foam glass, each with heavy galvanized steel access doors.

The 25 x 30' frozen foods room is kept at -20 F with a 5 hp Copelametic compressor, the produce room at 38 F by a 3 hp Copelametic unit and the big dairy products box at the same temperature by still another 3 hp machine. To eliminate a common problem — that of heavy condensation on the reach-in doors, Dennhardt installed two overhead Recold blower units with special deflectors which circulate chilled air longitudinally through the room and prevent any direct curtains of chilled air from striking the glass.

All of the compressors, controls and associated equipment for the "refrigeration center" were benched in two levels in an existing small storage space in the west rear corner of the original warehouse, well out of the way but thoroughly accessible for maintenance. Since its completion, the refrigeration investment has shown a swift amortization rate based on greatly increased sales of all items benefitting by the "refrigeration center"; adequate proof that simply lack of sufficient refrigerated display and storage space and chopped profits in the past.

Almost every Dennhardt supermarket installation has been a "complete" one, involving every piece of refrigerated equipment used throughout the store. Similarly, most of the company's installations incorporate innovations which invariably become a standard with the store group involved.

For example, when Dennhardt, on the basis of close planning with the management, received the full-

scale contract for Denver's largest suburban supermarket in the Lakeside shopping center, he planned for a basement refrigeration-equipment center. In this instance, the 20,000 sq. ft. store contract called for a 40-ton Trane store-wide air conditioning system, a 10-ton Trane conditioning system capable of cooling the meat department, completely glassed in, down to between 40 and 60 F, a one-door reach-in dairy products refrigerator, 100' of self service refrigerated meat display counters, 72' of frozen food cases, 144' of ice cream and frozen specialties display space, a 50 x 8' dairy box, and a 32 x 43' meat storage cooler. In addition, 12 other pieces of self-contained refrigerated display equipment were involved.



Dennhardt sold the supermarket management on planning a specific space for all of the refrigeration machinery and wound up with an allotment of 50 x 6' space, including an elevated concrete platform, 6" above the basement floor level, on which to make his installation. Well aware that many breakdowns in fixtures refrigeration are traceable to carelessness and abuse of the refrigeration equipment itself, Dennhardt also convinced the management to install a heavy steel fence from floor to ceiling which completely encloses the imposing row of compressors and cooling towers.

While this was, of course, an added expense, Dennhardt pointed out that damage to controls, wiring, refrigerant lines, etc., would be averted if the fence made it physically impossible to pile heavy cartons or cases on top of the

compressors and other equipment. Since then the heavy fencing, normally installed in outside yards, has become a "must" in subsequent market openings.

In this huge job, Dennhardt Refrigeration Co. installed in a single line within the steel fence, 13 5-hp Copelametic compressors supplying low-temperature equipment throughout the store; a 2 hp Copelametic, a 3 hp unit, a 10 hp Trane compressor for meat department refrigeration, and a 40 hp Trane unit for the overall store air conditioning. Every compressor is completely accessible down the fenced-in walkway, as are cooling towers at the extreme rear, damper controls throughout the air conditioning systems, etc.

The separate air conditioning system for the meat department incidentally, also was the result of long study and recommendation on Dennhardt's part. He successfully sold the management, already gearing up for a \$30,000 per week volume, on enclosing the entire 135' length of the meat department behind sliding glass doors and then maintaining much lower temperatures within.

The 10-ton Trane system, discharging through 22 "half-moon" outlets down the length of the packaging area, through the meat cutting room, etc., can easily maintain 40 F but in the interest of personnel comfort is operated between 55 and 60 F. The result, as Dennhardt promised the supermarket management, was a much richer, bright "bloom" on all meats, which, of course, translates to far greater salability.

Despite the fact that the great length of the meat department is entirely glass-enclosed, packaging girls, butchers, and superintendents can service the display refrigerators conveniently through sliding glass panes the entire length. Here, incidentally, coral hued display cases were used in place of the more traditional all-white variety.

In this way, through planning well in advance for the specific problems of specific store operators, Dennhardt has risen to the top rank of store refrigeration contractors in the Colorado capitol; and his "across the board" contracts have been uniformly among the largest ever written.

# INSTANT-ICE MACHINES

**SOME CHOICE  
TERRITORIES  
OPEN!**

The most complete  
line . . .

**14 MODELS!**

Production ranges from 600 lbs. to  
5000 lbs. per 24 hours. Air-cooled,  
water-cooled. Self-contained and re-  
mote models.

**THE HIGHEST QUALITY  
LINE!**

Precision-built . . . sold on quality,  
convenience and dependability.

**WRITE NOW!**  
for complete details . . .

**LIQUID FREEZE  
Corporation**

1133-24th ST • OAKLAND, CALIF.  
TEmplebar 6-0424

## HEAT PUMP . . .

*Continued from page 90*

Trane hermetic centrifugal compressors located in the main equipment room on the roof. Note that one of the circulating pumps picks up water returning from the heating coils in each of the coil and damper rooms throughout the building and delivers it to the condensers. From here it is circulated back to the supply side of the heating coils during the periods of heavy heating loads.

During the periods of heavy heat gains, a second circulating pump picks up water returning from the cooling coils and delivers it to the evaporators from where it goes back to the cooling coils.

Through a system of automatic controls, well water from well "A" is admitted to the evaporator or chilled water circuit and delivered to well "B", to balance the excess heating load during heavy heating periods. Conversely, the well water may be admitted to the hot water

circuit, passed through the condensers, and admitted to well "B" during periods of high heat gain. During the many intermediate periods when total heat gains are approximately equal to the total heat losses, very little well water is used and the "CenTraVacs" operate as balancing units for the two sides of the system.

The refrigerant cycle illustrated shows typical heating season operating temperatures. The graph indicates the refrigerant operating point for various limit conditions.

The rooftop location of the mechanical equipment was the result of lack of space on the ground floor and the undesirability of a basement below grade. Since the building was all reinforced concrete and the equipment was located near an elevator shaft core, the loads of the equipment did not place an appreciable penalty upon the structural system. In the opinion of the consulting engineers, this equipment has developed no objectionable noise or vibration.

After one year of operation, the operating staff of the building com-

## REMOVE CONDENSATE WATER FROM AIR CONDITIONING SYSTEMS



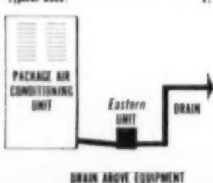
A completely automatic, foolproof unit designed to remove hot or cold condensate fluids from the receiver tank and pump it to an outside drain. Simple to install with air conditioning equipment, it gives quiet and reliable performance.

### Eastern Model 3, Type 100:

Tank capacity 0.8 gallon. Centrifugal pump delivery approximately 4½ GPM at 0 P.S.I. and shut off of 12½ P.S.I. Motor 1/40 H.P., 115 volt. Weight 23 pounds. Mercury control switch. Size 5½ inches wide, 10 inches long, 11¾ inches high.

**EASTERN INDUSTRIES, INCORPORATED**  
100 SKIFF STREET, HAMDEN, CONN.

Typical Uses:



pared the per cubic foot cost of the heat pump system with the per cubic foot cost of an industrial heating system installed in a new shop building with comparable floor space. The latter system consists of an oil-fired steam boiler with a large network of steam unit heaters.

The initial cost of the heat pump system, this analysis revealed, was more than that of the industrial

#### BOOK REVIEW

The Chemical Formulary, Vol. 10.  
Publisher: Chemical Publishing  
Co., New York City. Pages: 384.

This tenth volume of the Chemical Formulary contains hundreds of new formulas covering a wide scope of products and methods. It does not duplicate any of the formulas included in the previous volumes, but lists a wide array of modern and salable products from every branch of the chemical industries.

Formulas covered in this volume include abbreviations, adhesives, cosmetics and drugs, emulsions and other colloids, farm and garden specialties, food products, inks and marking compounds, insecticides, fungicides and weed killers, leather, lubricants and oils, materials of construction, metals and their treatment, paint, varnish and lacquer, paper, photography, polishes, explosives, rubber, resins, plastics and waxes, soaps and detergents, textiles, etc.

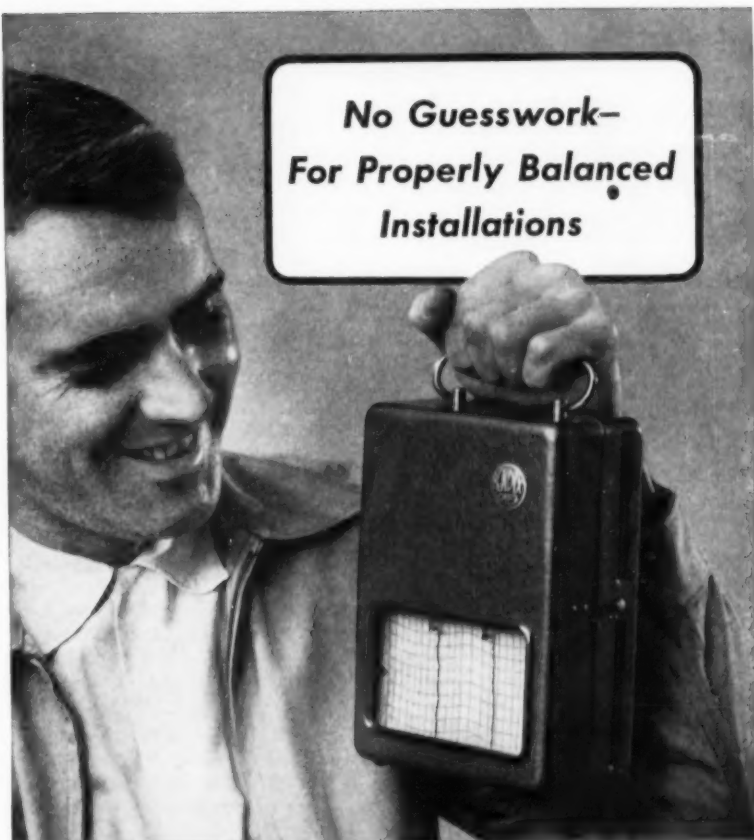
The book should be useful for the practicing chemist, beginner and student, as well as for businessmen who are searching for marketable products to start or expand their business.

heating system, but a comparison of operating costs disclosed that the heat pump costs, covering both heating and cooling, were only one-third those of the industrial heating system which provides heating only. These figures included amounts for fuel, power, operators' salaries, maintenance and repair, and operating supplies.

All Trane equipment for the Tacoma City Light administration building was installed by Northwest Mechanical Contractors of Tacoma.

**BUY FROM YOUR  
REFRIGERATION WHOLESALER**

**No Guesswork—  
For Properly Balanced  
Installations**



## PORTABLE TEMPERATURE-HUMIDITY RECORDER HELPS YOU SELL, SERVICE AND INSTALL!

There's no need to gamble when you can be sure. The Bendix-Friez\* Portable Temperature and Humidity Recorder has taken the gamble out of air conditioning and refrigeration installations. It gives you a permanent record of all temperature and humidity fluctuations on a single chart. You don't have to estimate the problem—you can *know* exactly what conditions you are dealing with before any installation is begun. In addition, it proves the operating efficiency of your equipment after it is installed.

The Portable Recorder is an excellent selling tool, too. Installed for a short period in a prospect's plant, it will provide information to help you explain just why your equipment is needed, as well as the precise type of equipment required for the job.

Completely automatic, the Recorder does not need wet bulbs, wicks or psychrometric tables and is built for 10-hour or 30-hour continuous operation. Write for our brochure "Bendix Tools for Heating, Refrigeration and Air Conditioning". Address 1401 Taylor Avenue, Baltimore 4, Maryland.

\*REG. U.S. PAT. OFF.



The Bendix-Friez Hygro-Thermograph (above), for more permanent installations, is a superior temperature and humidity monitor, built to U. S. Weather Bureau standards.

**Friez Instrument Division**



## Versatile New Ranco 016 Controls Simplify Commercial Installations

**New Pressure and Temperature Controls  
Feature Higher Electrical Ratings,  
Range and Differential Adjustability**

Your control installations on heavy-duty refrigeration and air conditioning equipment are strictly routine with Ranco's new series 016 Controls.

The eleven versatile Ranco models in the new 016 line—including low pressure, high pressure and temperature types—are built to accommodate the higher electrical ratings of some commercial equipment. All models feature single pole, double throw switches designed to open or close on rise of temperature or pressure. And all can be provided with manual reset feature.

Pressure control ranges vary between 5 and 360 psi with adjustable differentials from 10 to 100 psi. Temperature models feature  $-30^{\circ}$  to  $105^{\circ}$  ranges, adjustable differentials from  $2\frac{1}{2}^{\circ}$  to  $27^{\circ}$ , or fixed differentials of  $2^{\circ}$  to  $4^{\circ}$ .

Electrical ratings are approved and listed by UL and CSA: 115 and 230 a.c. Maximum Motor Amp Ratings: Full Load—15.5; Locked Rotor—60.

For full details on the efficient new 016 Ranco Control to simplify your commercial installation, contact your Ranco Wholesaler today.

# Ranco Inc.

COLUMBUS 1, OHIO



### Ranco Low Pressure Commercial Refrigeration Control, 016-107

- Contacts open or close on rise of pressure.
- Single pole, double throw switch.
- For  $SO_2$ ,  $CH_2Cl_2$ , F-12, F-22 and Carrene 7 refrigerants.
- 5 to 95 psi range.
- 10 to 40 psi adjustable differential.
- $10^{\circ}$  vac. lowest operating point.
- 115 and 230 V. a.c., 15.5 amps full load, 60 amps locked rotor.



WORLD'S LARGEST MANUFACTURER OF REFRIGERATION CONTROLS

# Here's How

## PROFITABLE SERVICE AND INSTALLATION PRACTICES

### Here's a List of Don'ts For Vibration Control

Many a lengthy article has been written on the subject of machinery isolation, explaining what should be done to keep any piece of refrigeration or air conditioning machinery from transmitting its vibrations to the base on which it is mounted. Sometimes, however, it's easier to approach a subject like this from the negative side, so here is a list of seven things not to do:

Don't put a solid sheet of cork, rubber or other material under the complete base.

Don't neglect the overhang of the drive. If you do the machine will rock excessively.

Don't use a material that will soften in warm weather and flow out from under the base, or a material that will harden in cold weather.

Don't ignore uneven weight distribution.

Don't use a brittle isolator.

Don't use a dead or lifeless material.

Don't separate the driver and the driven unit. In other words, compressor and motor must be on a common rigid base before isolating.

### Revised Handbook Of Metal Sawing Available

A completely revised 36-page edition of the W. O. Barnes "Handbook of Metal Sawing" is now available.

The handbook covers the proper selection and use of hand and power hack saw blades and hand saw blades. Selection of the correct blade for any job is simplified by charts. Recommended cutting speeds, feeds and techniques are also tabulated.

Common metal cutting problems and their preferred solutions are a feature of this edition.

For the user's convenience, all items in this handy, pocket size

handbook are indexed for quick reference.

Copies may be obtained through all Barnes' industrial distributors or by writing direct to W. O. Barnes Co., Inc., 1297 Terminal Avenue, Detroit 14, Mich.

### Fog Adds 1500 Miles To Routine Service Call

The Trane Co., manufacturer of air conditioning and heating equipment, has always taken pride in its far-flung service organization, and its reputation to service a job no matter what.

**I**N our town, we frequently have trouble with the valves that control the flow of water in ice cream dipper containers. The high water pressure wears out the valves rapidly.

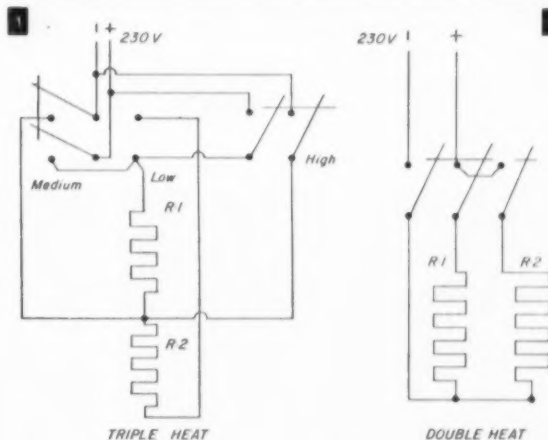
To eliminate this difficulty, I use a 20' coil of 1/8" copper tubing as a capillary to regulate the flow of water. This amount of tubing is just right for a water pressure of 90 to 100 pounds. Needless to say, a strainer should be placed in the water line ahead of this coil of tubing.

**George McGinley**  
Louden, Tenn.

But when Jim Mack submitted a report covering a 1,888 mile service call, there were some raised eyebrows—especially since the job in question was only 180 miles away from Mack's Louisville, Ky., headquarters.

This is what happened.

Mack flew to Evansville, Indiana—a 36 minute hop—was met by a contractor and driven 55



**M**ANY times, in industrial process work, the engineer may encounter heating applications that do not require the accurate controls afforded by thermocouples, recording charts, and magnetic switches. For such installations, ordinary blade switches can be arranged to control the heat values within certain specified values, as shown in the accompanying sketches.

Fig. 1 requires the use of two switches—a double-pole, double-throw unit and a double-pole, single-throw unit—plus two heating elements of the desired watt capacity needed to produce the heat volume required.

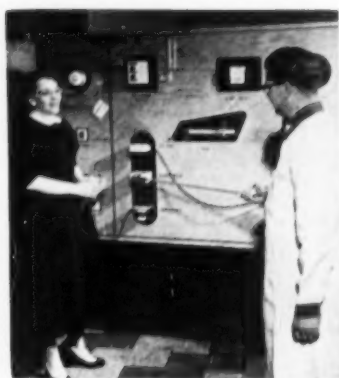
When the double-throw switch is in the right hand closed position, elements R 1 and R 2 are operated in series for low heat output. When the same switch is closed in the left position, element R 1 is receiving full

voltage to produce medium heat volume and element R 2 is out of the circuit. For maximum heating effect, the double-pole, single-throw switch is closed to place both R 1 and R 2 across the power supply.

Fig. 2 illustrates another simple circuit which makes use of two switches—a double-pole, single-throw type, and a single-pole, single-throw unit. With the double-pole switch closed, element R 1 is at full output and produces one-half the possible heat energy. With both switches closed, element R 2 also is at full heat capacity.

While the plus and minus symbols indicate the use of direct current in the described circuits, it is readily possible to use alternating current at equivalent voltage.

**Paul C. Ziemke**  
Clinton, Tenn.



**A LADY SERVICEMAN!** Doing a man's job is Mrs. Anne Carolyn Tomlinson from Atlanta, Ga., who is the first of her sex to attend a Janitrol heating and air conditioning service school. She later was appointed service manager for Delta Heating Co., Atlanta, and now directs the work of four men. Incidentally, she is the mother of two boys.

miles to the job site at Petersburg, Ind.

On the return flight the pilot was attempting to land on a new runway at Louisville only to discover it was under construction. As the pilot pulled up for a second try, fog closed in the airport.

Unable to land, the plane flew non-stop to La Guardia field in New York. Mack flew back the next morning.

Total mileage—1,888.

"And all for a motor that needed oiling," said Mack.

## PUBLIC TO SEE ARI SHOW THIS YEAR

This year, for the first time, the public will be admitted to the ARI Exposition.

Sponsors of the 10th Exposition of the Air Conditioning & Refrigeration Industry have decided, because of the growing interest in residential air conditioning, to permit the public to attend and view the exhibits on Thursday, Nov. 21. It is expected that thousands of interested visitors, aside from members of the industry, will visit the show to learn of new developments in refrigeration and air conditioning.

The exposition, set for Nov. 18-21 in Chicago's International Amphitheater, will occupy approximately 100,000 sq. ft. of exhibit

space, about 15% more than the 1955 exposition, held in Atlantic City. About 300 manufacturers will exhibit their products.

Applications for exhibit space should be made to the offices of the 10th Exposition of the Air Conditioning & Refrigeration Industry at 1346 Connecticut Ave., Washington, D. C.

## NEW NAME, HYDRONICS, PROPOSED BY IBR

A new name, "Hydronics", has been proposed by a special committee of the Institute of Boiler and Radiator Manufacturers for adoption by the industry to describe and identify the multitude of uses of controlled water for heating and cooling.

The new name is intended to replace the several terms (wet heat, fluid heat, liquid heat, etc.) that have been used in the past to characterize the science of heating and cooling with water. It was introduced by a committee headed by Edward F. Ford, of Bell & Gossett, at the annual IBR meeting in Absecon, N. J.

## OUTLASTS ANY OTHER PIPE JOINT COMPOUND PLS\*

John Crane "Plastic Lead Seal" seals for the life of the connection, regardless of vibration, expansion or contraction, temperatures to 550°F. or pressures to 6000 psi. Yet connections can be easily disassembled any time, because PLS remains plastic at all times.

It costs less to use PLS, because it takes less to make a perfect seal on pipe joints, plugs, screwed fittings, flanges and gaskets... ideal for water, oil, gas, steam, refrigerants, chemical and petroleum products.

Send today for a Free Sample.



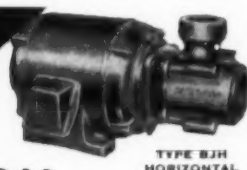
Available in 1-lb. cans (brush top or friction), 5-lb. cans, 15 and 28-lb. pails, 85-lb. drums or 4-oz. plastic tubes.

**JOHN CRANE CRANE PACKING COMPANY**  
6455 Oakton Street, Morton Grove, Illinois  
Crane Packing Company, Ltd., Hamilton, Ont.  
Circle No. 89 on Reader Service Card

## A GREAT NEW SERIES "by Aurora"

### AURORA® General Purpose CLOSE-COUPLED CENTRIFUGAL PUMPS

These are compact, simple, lasting pumps with low NPSH characteristics to meet critical suction conditions—for wide range of duties including hot water and chemicals handling.



TYPE B3H HORIZONTAL

IDEAL for AIR CONDITIONING REFRIGERATION COOLANT HOT WATER CHEMICAL\* GENERAL PURPOSE  
\*In special alloys to meet specific conditions



TYPE B3F FLANGE MOUNTED

CONSULT WITH US

**MANY VALUE FEATURES**  
SEALS or GLANDS—Available in either as desired.  
SPEEDS—3,500, 1750 (60 cycle) and 2,880, 1,440 (50 cycle) speeds.  
CURRENT—AC or DC—All voltages and phases.  
MOTORS—1/6 to 7-1/2 H.P. drip-proof, splash-proof, totally enclosed, explosion-proof and chemical. Quiet, efficient NEMA standard.

COMPACT, QUIET, ECONOMICAL  
WRITE FOR BULLETIN 119

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## AURORA PUMP DIVISION THE NEW YORK AIR BRAKE COMPANY

21 LOUCKS STREET • AURORA • ILLINOIS  
EXPORT DEPARTMENT—Aurora, Illinois—Cable Address "NYABINT"

Circle No. 88 on Reader Service Card  
JULY, 1957 • COMMERCIAL REFRIGERATION



TYPE B3V BASE MOUNTED

## TWO-MONTH COMPRESSOR SHIPMENTS UP 11%

Manufacturers' shipments of compressor bodies used in air-conditioning and refrigeration units were up more than 11% in the first two months of this year as compared with the same period a year earlier, it is reported by Geo. S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute.

The figures, which do not include compressors used in household refrigerators, were compiled from reports made to ARI by manufacturers whose output is estimated to represent in excess of 90% of the industry.

Actual shipments for the two-month period totaled 856,261 compared with 770,964 in the first two months last year. These totals do not include compressors designed for use with ammonia refrigerants.

Of the two-month total, 105,808 of the compressor bodies shipped were of the type used in automotive air conditioning. A comparative figure for 1956 is not available, but total 1956 shipments amounted to but 284,022 units.

### Manufacturers' Shipments Of Compressor Bodies

(Except for household refrigerators)

| Horsepower                          | Shipments Including Exports (number) |                |
|-------------------------------------|--------------------------------------|----------------|
|                                     | February, 1957                       | Jan.-Feb. 1957 |
| 1/5 HP & Under                      | 37,513                               | 72,201         |
| 1/4 HP                              | 67,939                               | 125,417        |
| 1/3 HP                              | 18,749                               | 32,673         |
| 1/2 HP                              | 8,061                                | 16,582         |
| 3/4 HP                              | 57,939                               | 123,322        |
| 1 HP                                | 108,124                              | 203,020        |
| 1 1/2 HP                            | 46,626                               | 73,723         |
| 2 HP                                | 33,982                               | 59,405         |
| 3 HP                                | 8,310                                | 17,331         |
| 5 HP                                | 6,533                                | 14,308         |
| 7 1/2 HP                            | 4,482                                | 8,271          |
| 10 HP                               | 1,090                                | 1,930          |
| 15 HP                               | 279                                  | 524            |
| 20 HP                               | 130                                  | 385            |
| 25 HP                               | 126                                  | 319            |
| 30 HP & Over                        | 497                                  | 1,042          |
| <b>TOTAL</b>                        | <b>400,380</b>                       | <b>750,453</b> |
| <b>Ammonia Refrigerant—</b>         |                                      |                |
| Total                               | 112                                  | 243            |
| <b>Automotive Air-Conditioning—</b> |                                      |                |
| Total                               | 57,773                               | 105,808        |
| <b>GRAND TOTAL</b>                  | <b>457,865</b>                       | <b>856,504</b> |

# Service-Master®

for '57 is

# BIGGER



### You get all these NO-CHARGE EXTRAS

- Nylon bushings in all door hinges—doors can't bind.
- Bins with adjustable dividers—plus a hinged cover that keeps parts in place.
- Key-locking doors—made from two steel panels for super strength.
- Ready-for-work shelves and bins—built right in the body.

Compartments are now 14½" deep... 2" deeper than ever. More space for large boxes and cans—for more tools, parts, and supplies, too. Cargo area, which stretches 48½" between compartments, has a tread-plate steel floor that really fights back when it comes to rough treatment. Models for old or new ½, ¾, 1, and 1½ ton chassis.

Available for immediate delivery in all 48 states

Optional equipment includes telescopic roof, ladder racks, pipe racks, vise bracket, and bumper-step. Canopy Top, shown here, furnishes more fully-enclosed cargo area.



### McCABE-POWERS AUTO BODY CO.

5900 NORTH BROADWAY  
ST. LOUIS 15, MO.

625 CEDAR STREET  
BERKELEY 10, CALIF.

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Please send me descriptive literature and name of my nearest SERVICE-MASTER distributor.

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COMPANY \_\_\_\_\_

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CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

57A

# CONTRACTORS

## Standard Warranty and Guarantee Adopted by Southern California RACCA Group

A standard warranty and guaranty for the refrigeration and air conditioning industry of southern California has been adopted by the membership of the RACCA of Southern California, according to Henry B. Ely, executive secretary of the group.

Printed forms have been prepared and are now available to members of the organization, Ely said.

He regards the development of these standards, along with a standard maintenance agreement also recently formulated and approved, as an important milestone in the history of the organization.

Once the principles of the new standards are established, contractors will have a common basis to use in weighing and evaluating charges to be made for work they perform under job specifications, Ely says. Competition between contractors then becomes a matter of service and not contract "gimmicks", Ely points out.

Following is the wording of the standard warranty and guarantee form:

To ..... (owner).

The undersigned Licensed Refrigeration and Air Conditioning Contractor extends to the owner the manufacturer's warranty against defects in material and workmanship of parts or equipment for the period of the manufacturer's warranty, beginning from the date of beneficial use or final acceptance, whichever is earlier.

In addition, for a period of ninety days from the date of beneficial use or final acceptance, whichever is earlier, the undersigned, upon notice during said period by the owner, will furnish, within regular working hours, all necessary service at no charge to purchaser, and all labor and material for the repair or replacement of defective parts or equipment, excluding

cleaning of filters, cooling tower and condensers.

This warranty and guaranty is in lieu of all other warranties and guaranties expressed or implied.

Dated this ..... day of .....  
..... 19 .....

..... (firm name)

By .....

State Contractor's License No. ..

Approved as to form: Refrigeration and Air Conditioning Contractors Association of Southern California, Inc.

### CHICAGO RACCA MARKS 10TH YEAR WITH PARTY

RACCA of Chicago celebrated its 10th anniversary recently with an open house dinner meeting at the Builders Club in Chicago, replete, even to the extent of a huge birthday cake.

Invitations were extended to 16 nonmember contractors for the purpose of acquainting them and giving them an opportunity to

learn all about the objectives and activities of the group.

Master of ceremonies was William L. Long, president of the Chicago organization.

### LABOR-MANAGEMENT GROUP SET IN N. J.

As part of the recent labor negotiations between RACCA of New Jersey and the United Association local unions, an article provided joint committee activity in training, public education, and in industry welfare. A joint fund to finance these programs provides for the services of an executive manager to coordinate the activities of both parties in their responsibility to make the overall program a success. This executive manager cannot be a member of either the union or the contractors' association.

Paul B. Hughes, a former New Jersey contractor, was selected for this job during a joint committee meeting held in Newark on May 7. Hughes is well known throughout the state by management and labor organizations. He will start his activities immediately.

He will be responsible for carrying out all programs as designed by the joint committee in minimizing the evils attendant with the rapid growth of the industry, maintaining a high standard of installation and maintenance, and in providing a high level of representation and operation for public

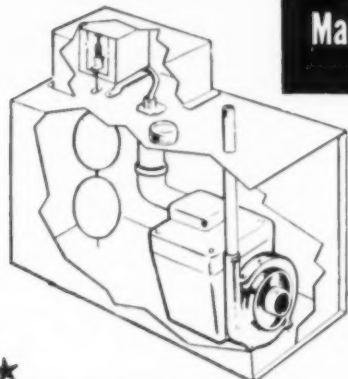


**HERE'S A VIEW** of part of the exhibition area at the Western Air Conditioning, Heating, Ventilating and Refrigeration exhibit and conference. Products of more than 100 manufacturers were displayed, and attendance was estimated at about 7,000.

# Little Giant



for  
the  
AIR -  
CONDITIONING  
Market



## ★ CONDENSATE UNIT For Refrigerated Units!

- Hermetically sealed Little Giant Recirculating Pump for trouble-free self-lubricating operation.
- Positive displacement switch with float control, double pole switch for complete circuit break plus a three-conductor cord available.
- Sturdy metal tank corrosion resistant.
- Small and Compact.
- Quiet in operation.
- Completely automatic.

## PUMPS FOR ANY AIR CONDITIONING APPLICATION



## Little Giant ★ RECIRCULATING PUMP

- Little Giant Pump, hermetically sealed in oil, self lubricating.
- Die-Cast aluminum case.
- Small and compact.
- Economical to operate.
- Available for 110 volt 60 cycle or 220 volt single phase current.
- Can be operated completely submerged.



ALSO AVAILABLE WITH  
VAPORIZER HEAD AND  
IMPELLER FOR EVAPORATIVE  
COOLERS

Write for free catalog and price list  
today!

## Little Giant PUMP COMPANY

Division of Little Giant Vaporizer Company, Inc.  
5101 Classen Blvd., Oklahoma City 18, Okla.



## Plastic Coating Stops Costly Condensation Drip and Rust

THE COSTLY PROBLEM caused by dripping from this sweating pipe was permanently solved with one easy and inexpensive application of NoDrip Plastic Coating. Sweating pipes, ceilings, air ducts and other metal equipment are also completely protected against rust and corrosion by low cost NoDrip.

NoDrip Plastic Coating acts immediately to insulate and protect. One application adds many years of service life to metal equipment. NoDrip is also resistant to acid, alkali and brine...protects concrete, brick, plaster, tile wood or composition surfaces.

Easy application requires no special equipment or skill. Anyone can apply NoDrip with brush, trowel or spray. Stop your condensation problem now! Get full details without delay.

JW **Mortell**  
COMPANY



FREE

32-PAGE NoDrip DATA HANDBOOK

Complete with photographs, charts and technical information to solve your condensation problem. Write today.

Available at leading refrigeration supply houses

J. W. MORTELL Co., 553 Burch St., Kankakee, Ill.

Please send my FREE copy of the NoDrip Data Handbook.

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Company \_\_\_\_\_ Title \_\_\_\_\_

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Circle No. 92 on Reader Service Card

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& AIR CONDITIONING • JULY, 1957

## WITT Zone Air

**ROOM UNIT  
AIR CONDITIONER**



### For New and Old Construction

"Miraculously Quiet" Zone Air, ideal for hotels, motels, hospitals, offices and other applications where silence is essential. No costly duct work—no tearing out partitions in existing buildings—simply connect pipes from unit to a cooling or hot water system.

Used with direct expansion, combination heating and cooling with water or direct expansion and steam—individual control. 17 sizes: 300 to 3300 CFM. Concealed or cabinet type models.

Write for information  
**A. H. WITT COMPANY**  
940 N. Sycamore Av., Los Angeles 38



**OVER 30 YEARS  
RELIABLE SERVICE**

protection. His duties will include establishing of apprentice and journeymen training classes throughout the state, as well as to promote local county and state codes.

He will work closely with public service agencies who are interested in providing protection to the contractor and the public through interpretation and adherence to the rules of practice for the industry as established early in 1956 by the FTC.

Hughes will operate from an office financed by the joint fund. The joint committee operates under a trust agreement that has been approved by RACCA and United Association attorneys. The joint committee meets monthly and is composed of five members from RACCA of New Jersey and five members from the New Jersey committee representing the UA.

#### U.A. SET TO DEVELOP LABOR OBJECTIVES

It's announced that the national office of the United Association, under the direction of Joseph F.

Monahan, is ready and willing to work with affiliated local contractors' associations throughout the nation in developing each and every one of the national labor objectives. Monahan is the newly appointed head of the Refrigeration Division within the U. A.

These objectives are as follows: (1) Recognition of the local RACCA group as bargaining agent. (2) A division of refrigeration and air conditioning mechanics within the local union. (3) Acceptance of qualified mechanics to union membership in the building trades division. (4) Freedom of movement of mechanics from one jurisdiction to the other. (5) Establishing of an adequate apprentice and journeymen training course. (6) Establishing and functioning of a local joint industry board.

#### NEW REMINGTON REP

Remington Air Conditioning has appointed J. V. Folsom and Son, of Houston, as its room air conditioner representative for Texas and Oklahoma.



**Save Time—Save Money**

with these dependable  
**Insulation Hangers**

### Will not damage protective coating in any way



Here's what you need for fast, easy, low-cost application of insulation to ducts, etc. *Gemco Metal* Insulation Hangers and *Tuff-Bond General Purpose* Adhesive for rough surfaces... *Tuff-Weld Nylon* Insulation Hangers and *Quik-Set* Adhesive for smooth surfaces. These hangers and adhesives provide ample strength to hold insulation in place securely. (Use *Gemco Self-Locking Washers* to lock insulation to hangers.) Investigate today!

GOODLOE E. MOORE, Incorporated, Danville 40, Illinois  
or... W. D. Elmslie, Ltd., 4837 Lawrence Blvd., Montreal, Canada  
Please send complete details and prices on *Gemco* and *Tuff-Weld* Insulation Hangers.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

Circle No. 94 on Reader Service Card

## Take your choice!

### ELLISON AIR FILTER GAGES IN 3 TYPES

Ellison Air Filter Gages are high precision instruments—not dime store gadgets. Built for a lifetime of dependable service. Widely used in public buildings, hotel, hospital and office buildings. Three types offered:

#### Inclined Tube Type

Accurately indicates air flow resistance in duct at air filter. Easy-read white enamel scale. Level and tube replaceable on the job. Easily installed.



#### Diaphragm Actuated, Dial Type

High powered, free floating diaphragm. Accurate pointer mechanism floats on knife-edge bearings. Easy to read—readily installed.



#### Bell Actuated, Dial Type

Bell submerged in oil pan actuates the accurate mechanism which floats on knife-edge bearings. Bell oil easily replenished through inlet at top.



● Ask for Air Filter Gage Bulletin 214.

#### ELLISON DRAFT GAGE CO., INC.

555 W. MONROE ST. Since 1896 CHICAGO 6, ILL.

The Ellison Line Also Includes:  
Draft Gages, Bell and Diaphragm—Inclined Draft Gages—Portable Inclined Vertical Tube Gages—Vertical Tube Gages—Oil, Heavy Liquid and Mercury—Single and Multi-Tube-Saturator Gages—U Gages—Stationary and Portable—Air Filter Gages—Dial and Inclined Tube Types—Pitot Tubes—U Path Steam Calorimeters—Portable Gas Analyzers—Orsat Type

Circle No. 93 on Reader Service Card

JULY, 1957 • COMMERCIAL REFRIGERATION

## THERMOSIPHON . . .

Continued from page 87

water portion of the system to prevent freezing during shut-down periods in an area where the average outdoor temperature during the winter is about 10 F.

Eichmann points out that more recently designed systems use only 20 to 25% of the water volume employed in this particular church heating system and that, where lower outdoor temperatures are encountered or shut-down periods are longer, light mineral oil is substituted for water in the heat exchanger to preclude freeze-ups during non-operating periods.

### Operation Is Economical

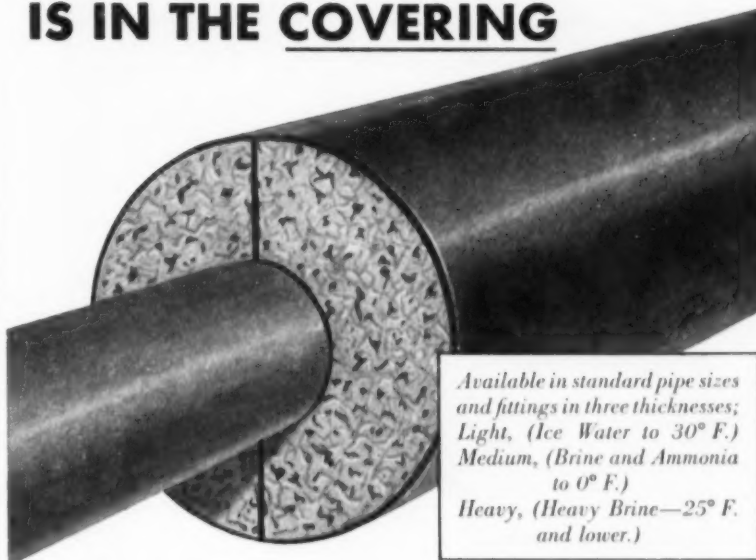
Comfortable temperatures are attained in the church within 1½ hours when the outdoor temperature ranges in the mid-thirties. This is a big economic advantage, Eichmann stresses, when compared with the average hot water heating system which would require six to seven times that period to do the same heating job. After the church services, the system is closed down simply by opening the switch to the oil burner. Then, as the temperature drops, the refrigerant simply flows back to the heat exchanger in its liquid form, leaving the radiators free of liquid.

The 8' radiators in the Swiss church are made up of ¾" vertical steel tubes approximately 30" long and welded to a horizontal 1¼" steel pipe, with the upper ends of the tubes closed. One continuous pipe about 90' long and running the length of the church assembly room carries the refrigerant vapors to each radiator and also serves to return the condensate to the heat exchanger.

In operation, the refrigerant condenses back to a liquid in the radiator coils, so the supply line slopes slightly toward the heat exchanger to provide a natural flow of the liquid refrigerant from the radiators back to the heat exchanger. Radiators are placed approximately 3" from the wall and elevated about 12" above the floor.

**BUY FROM YOUR  
REFRIGERATION WHOLESALER**

# The heart of the matter IS IN THE COVERING



Available in standard pipe sizes and fittings in three thicknesses; Light, (Ice Water to 30° F.) Medium, (Brine and Ammonia to 0° F.) Heavy, (Heavy Brine—25° F. and lower.)

## UNITED CORK PIPE COVERING THE IDEAL COLD LINE INSULATOR

Improper pipe insulation can mean an excessive loss in refrigeration efficiency and dollars to the cold storage operator. It is important to get the right pipe covering insulation that will have all these advantages:

- Extremely low "K" factor
- Retains over 80% of cold loss on piping
- Easy and economical to install
- Long trouble-free life
- Fire retardant—Vermin resistant
- No capillarity

### LARGER STOCKS—FASTER DELIVERY—PERSONAL SERVICE

United Pipe Coverings are available from stock for prompt delivery—to fulfill your immediate installation requirements. Mail the coupon below for additional information or the United distributor nearest you.

Corkboard



Pipe Covering



Tank Lagging



Manufacturers of cork  
insulation for almost  
a half century

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Engineering offices, or approved distributors, in key cities—coast to coast.

Circle No. 96 on Reader Service Card

# Schnacke Thermatrol

## COOLING TOWERS



**PCT FEATURES**

- Blow through dry fan & Motor
- Simplified, compact, Symmetrical Construction
- Easy access for Service
- Sizes 3 to 50 Tons

**At a NEW LOW PRICE!**

**Models PCT - for outdoor installation**  
 Propeller type-blow through design assures dry fan and motor — plus more symmetrical appearance and increased efficiency. Excellent air delivery requires less horsepower. Quality, time tested design and construction. Attractive multicolor green finish over etching type primer assures corrosion resistance.

**Models SCT — with centrifugal fans also available for duct installations.**

**Write for prices and brochure.**

*Made by Experts in the Refrigeration & Air Conditioning Field*

**SCHNACKE, INC.**

EVANSVILLE 7 INDIANA

## TRANE SURVEY REPORTS AIR CONDITIONING GAIN

Substantial gains in air conditioning with predictions of consistent future growth are reported in a survey of public utilities by Trane Co.

After querying 50 power companies and water departments in leading cities across the country, the survey shows these facts:

(1) Every company participating in the survey reported marked increases in the installation of air conditioning in its area, as measured through tons of refrigeration on its lines.

(2) The degree of increase was more pronounced in the South, but the difference between other



**HERE'S PROOF** home air conditioning systems do not have to be big, bulky, and unattractive to cool your home adequately! Biggest cabinet shown is ordinary, average-size automatic washer. Smaller unit is "Flow-Pac" water chiller for home air conditioning, manufactured by Acme Industries, Inc. Only 18 x 24", unit easily handles cooling requirements for most homes.

land areas of the country was not great, indicating that outside temperature alone is not responsible for the growth of air conditioning.

(3) Central air conditioning systems are becoming increasingly popular for residential applications.

(4) Commercial and industrial air conditioning are becoming a competitive necessity in many parts of the country.

(5) Power and water companies expect an upsurge in the use of air conditioning in the years ahead and many are making plans now to meet the increasing demand on their facilities.

THE MARK OF QUALITY



## Automatic Controls

A high-quality, highly dependable automatic control for suction pressure of multiple refrigeration compressors. Features simplified pressure setting which can be easily locked into desired position. Switch action is single-pole, double throw with proportioning solenoid. Rating: 1/2 amp at 25 volts a-c. Easily installed.

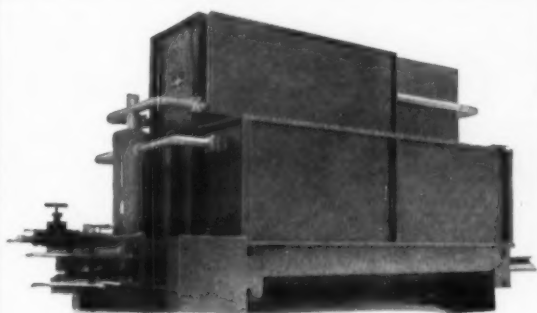
## PROPORTIONING PRESSURE CONTROL for multiple compressors



For complete details see the Barber-Colman Field Office near you, or write for illustrated data bulletin F-6540-1.

## BARBER-COLMAN COMPANY

Dept. S, 1338 Rock Street, Rockford, Illinois



## NIAGARA SECTIONAL Aeropass CONDENSER

gives you lower cost refrigeration,  
saves you **LABOR**, Power, Water

- Because Niagara "Duopass" pre-cooling removes super-heat and gas condenses at lower temperature.
- Because the system is automatically purged of oil.
- Because the new design improves the heat transfer to the out-door air by evaporation.
- Because these features keep the condenser working for long life with "new plant" efficiency... always full capacity.
- Because you save 95% of cooling water cost.

You save labor in upkeep. With full access to all parts and interior piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 60 to 240 tons. No other condensing method gives you so much saving in money and trouble.

Write for Niagara Bulletin 131.

### NIAGARA BLOWER COMPANY

Dept. CR-7, 405 Lexington Avenue  
NEW YORK 17, N. Y.

District Engineers in Principal Cities

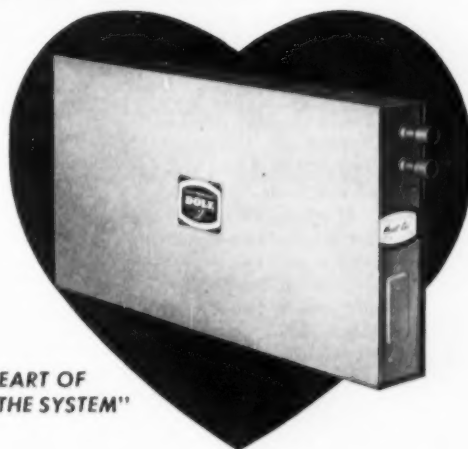


Over 40 Years Service in Industrial Air Engineering

Circle No. 100 on Reader Service Card  
& AIR CONDITIONING • JULY, 1957

## DEFROST PROBLEMS? Here's the ANSWER!...

# ELECTRIC Heat-Cel



"HEART OF  
THE SYSTEM"

## Automatic DEFROST FOR NEW OR EXISTING INSTALLATIONS

- Heat for re-evaporation supplied by low wattage, long life ELECTRIC HEATER.
- Positive, consistent, economical.
- Performs efficiently in any ambient, regardless of location or season.
- Independent of compressor operating time or type (air or water cooled).
- Solution temperature automatically maintained by thermostat.
- Adjustable for individual operating conditions.
- No special controls needed for winter-time operation.
- Higher wattage elements available for extreme conditions.
- Heater replaceable in the field.
- Patented DOLE VACUUM principle insures faster heat transfer for quicker defrosting... convenient "plate" design allows flat-against-wall mounting.

Write for Engineering Catalog DBE.

Defrosting "Kit" includes  
*Heat-Cel*\* and  
Accessory Package containing  
all necessary controls

\* Approved by Underwriters Laboratories



### DOLE REFRIGERATING COMPANY

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103 PARK AVENUE, NEW YORK 17, N. Y.  
In Canada: Dole Refrigerating Products Limited  
44 Elgin Street, Brantford, Ontario

Circle No. 99 on Reader Service Card

### How to Design Your Air Conditioning Installations for Quieter Operation

by Arthur H. Farr

IN our article in the May, 1957 issue of COMMERCIAL REFRIGERATION & AIR CONDITIONING, we dealt with some of the basic definitions and concepts of sound as it might apply to an air conditioning system. We found that the principal sources of noise from an air conditioning system are the compressor, fan, fan motor, and the turbulence caused by the flow of air through the duct system. This article will present some of the practical approaches that can be taken to reduce noise levels in the design of a residential or commercial system.

First of all, one of the most objectionable sources of sound in an air conditioning system has, in many cases, been eliminated by the industry trend towards remote air-cooled condensing units. A few short years ago, it was necessary to design a system with the refrigeration compressor operating in, or very close to, the conditioned area.

#### Remoting Compressors Helps

With today's remote air-cooled units, however, the compressor can be located outdoors. This advancement eliminates the problem of the compressor located in the conditioned area, which was quiet when originally installed, but developed an objectionable noise level in the second or third summer of operation.

Initially, the air-cooled trend was confined to residential jobs because air-cooled equipment was limited to the small horsepower sizes. However, today we find available packaged remote air-cooled condensing units up to 20 tons in capacity. It is now commonplace to see commercial and industrial jobs requiring in excess of 100 tons of capacity, where the remote air-cooled units are installed outdoors. This certainly has been a major break-through in the problem of reducing the sound level of the air conditioning system.

Steady progress has also been made in designing air conditioning blowers, fans, and blower motors for quieter operation. Today the contractor buys equipment with a much lower operating sound level than was possible a few years ago.

In spite of the fact that compressors can now be installed outside of the shell of the building and air handling equipment with low sound levels can be obtained, many con-

tractors still do not achieve adequate sound attenuation because of their own failure to design a quiet system for air distribution.

A few basic design hints are all that the contractor needs to remember in laying out an acoustically satisfactory air distribution system:

1. The fan-coil unit should be insulated internally for thermal reasons as well as for acoustic considerations, and it should be suspended or mounted on vibration-absorbing mounts.
2. Always use an adequate canvas connection where the supply and return duct join with the fan-coil unit. If a separate fresh air duct is run to the fan-coil unit, this should also be broken with a canvas connection at the unit.

#### Sound Traps Cut Duct Noise

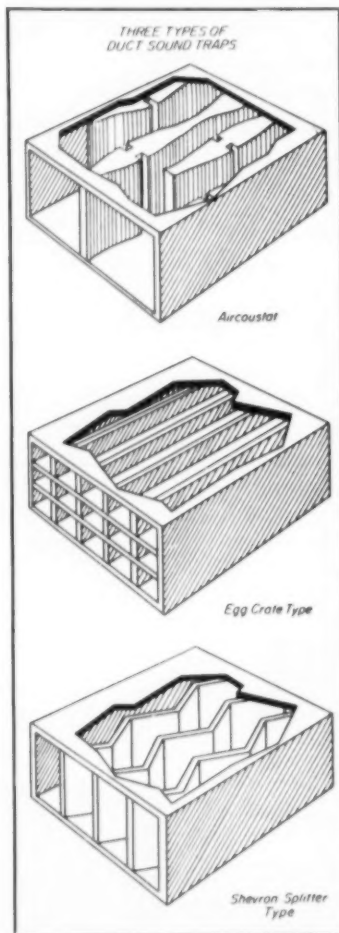
3. Sound attenuation in the supply duct can be accomplished in varying degrees by either lining the duct with acoustic insulation, or the use of a commercial sound trap inserted in the duct stream. (See illustration for three typical traps).

If the supply duct is lined with a sound-absorbing material, it is good practice to extend the length of insulation to include a couple of elbows where the air changes direction. Also, it is helpful to remember that as the cross-sectional area of the duct increases it becomes necessary to line the duct for a greater length to obtain satisfactory attenuation.

The commercial sound traps which take the place of acoustic duct lining in a system should be checked for each job application with the local supplier or representative. Generally speaking, the commercial sound traps are more effective in absorbing the low frequency sounds than would be acoustic duct lining.

4. If steps 1, 2 and 3 are taken, it is still possible for the contractor to find himself in trouble if he is not careful in his selection of grilles and outlets. The manufacturers of grilles have been well ahead of the industry in general in studying sound and improving their product in relation to low sound level operation. Checking with the local grille supplier before selection of grilles and outlets will minimize troubles in this area.

Here is a useful rule-of-



# REMOVE THE SCALE... SAVE THE EQUIPMENT!

**"VIRGINIA's" new solid scale remover  
is pronounced safest for use on dip zinc coated,  
galvanized and aluminum water-cooled equipment**



**LOOK FOR THIS  
SEAL OF SAFETY**

Every drum of new "Virginia" solid scale remover bears the seal of safety which relieves you of worry about equipment injury. Use "Virginia" to restore peak heat-transfer efficiency of your water-cooled equipment—quickly, economically. Avoid costly shutdowns—eliminate the personal hazards of handling corrosive liquids. *Insist on the new, improved "Virginia" formula with the seal of safety atop the drums.* Packed in 10 and 50-lb. drums.



**STOP SCALE FORMATION** with "Virginia" Water Treatment and Corrosion Inhibitor. Holds scale-forming solids in suspension or solution, greatly reducing scale buildup on metal surfaces; protects against corrosion. Packed in 6 and 50-lb. containers.

Order these field-tested products from your wholesaler or write REFRIGERATION DIVISION, Virginia Smelting Co., 337 Jefferson St., West Norfolk, Va.



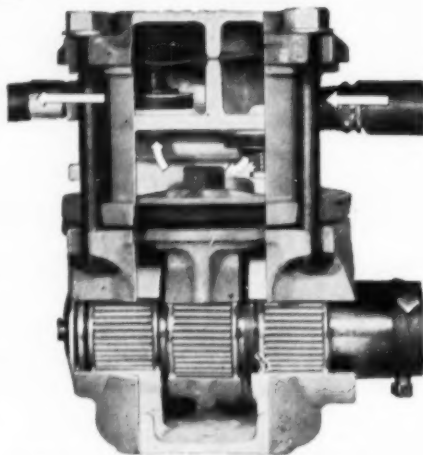
ESOTOD • KINETIC CHEMICAL'S "FROTH" REFRIGERANTS • V. METH. L. CAN. G. GAS • PERMAQUIN • PRESSTITE TAPE • KwikWRAP • SUNISO REFRIGERATION OILS • WATER TREATMENT CHEMICALS  
Available in Canada and many other countries

## Solve your service problems with the ACE Diaphragm Descaling Acid Pump

- All parts in contact with descaling compounds are acid resistant . . . Neoprene diaphragms . . . nickel-iron pumping chamber. Stainless steel valve parts. New Hastelloy "C" Valve Springs.

- Entire unit is portable . . . pump and motor mounted on sturdy base with convenient carrying handles.

- Manufactured and guaranteed by the makers of the complete line of Ace cooling tower circulating pumps . . . 1/4 H.P. thru 7 1/2 H.P.



*Manufacturers representatives and distributor inquiries invited.*



thumb for grille selection. When a sound of a certain intensity is added to another sound of equal intensity, the increase in the total noise level is always 3 db. Thus, if you are air conditioning an office with 40 db background noise, and you select an air outlet to deliver the design CFM at 40 db, the resulting sound level in the office will be 43 db.

### REFRIGERANTS BOOKLET RE-ISSUED BY ARI

A new edition of "Properties of Commonly Used Refrigerants" has been issued by the Air-Conditioning and Refrigeration Institute, and is available to manufacturers, engineers, colleges and universities, service men, and others who may have occasion to use it.

The new book is a revision of a publication issued by the Air Conditioning and Refrigerating Machinery Association, one of ARI's predecessor organizations, in 1943. The 136-page publication sells for \$2, and may be obtained from ARI in Washington.

## Buy... Try... Compare the NEW **DFN** LIQUID INDICATORS

(Double Port - - Non-Directional)

- **PERMANENTLY LEAKPROOF** —  
because they're hermetically sealed
- **PERMANENTLY FOOLPROOF** —  
no gaskets, springs or gadgets to fail or restrict flow



**APPROVED FOR SAFETY**

**More features — yet cost no more!**

The new Model 75 DFN Liquid Indicators give you 2 large viewing windows, crystal clear for undistorted view, hermetically sealed in a rugged forged brass body. Thoroughly lab tested—field proven in thousands of installations. Available in 4 types, offering 19 connection sizes.

**THE McINTIRE COMPANY, Livingston, N. J.**  
Makers of DFN DRIERS • FILTERS • STRAINERS  
Since 1925



## TRANE TO BUILD PLANT IN CLARKSVILLE, TENN.

Trane Co. has selected Clarksville, Tenn., as the site for its southern plant.

The plant, to cost about \$2 million to construct and equip for production, will manufacture central residential air conditioners for year-round heating and cooling, marking entry into a new segment of air conditioning for Trane. Production is scheduled for 1958.

## ANSUL PHILADELPHIA OFFICE RELOCATES

Ansul Chemical Co. has moved its Philadelphia sales office to a new location at 1 Bala Ave., Bala Cynwyd, Pa. Bob Kearney and Rex Whitlow are refrigeration representatives in the office.

## BARNEBEY-CHENEY REP.

R. E. Chase and Co., Inc., with offices in Seattle and Tacoma, has been appointed sales representative for PurAir activated charcoal air purification equipment in the state of Washington, west of the Columbia River.

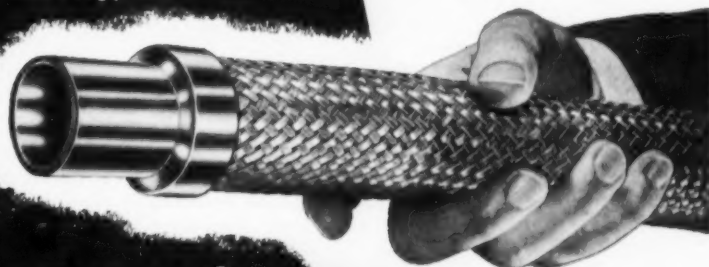
## "OUT OF THIS WORLD"



**FEATURES** of the new "Drymaster" filter-drier recently introduced by Mueller Brass Co. are discussed here by Orville Payton (left), advertising manager, Charles Black (center), manager of the wholesale distributing division, and Robert Gray (right), who heads the company's development engineering department. As part of the company's advertising and promotion theme that its 1957 products are "out of this world", Mueller Brass is supplying wholesalers with an easel-mounted display which contains a handbook on the new filter-drier, and a cut-away unit.

only **PACKLESS** gives you

**ALL THIS....**  
and **IMMEDIATE**  
delivery, too!



**PACKLESS® SEAMLESS**  
**VIBRATION ABSORBERS**

made by the pioneers...  
specialists in metal hose

### CHECK THESE EXCLUSIVE FEATURES:

- ☒ High-tensile braid provides complete absorption of movement—strong, efficient, no whip transmission.
- ☒ Polished clean, de-burred, ready for installation and smooth, trouble-free operation.
- ☒ Ends sealed after internal cleaning, insuring completely moisture-proof chamber.

### PLUS

PROMPT DELIVERY TO YOUR  
MOST PRECISE NEEDS

Write today for detailed catalog sheet

**PACKLESS METAL HOSE, INC.**

Distributors  
and Representatives:  
Some choice territories open.

730-10 So. Columbus Ave., Mt. Vernon, N. Y.



**WATER  
SHORTAGE?**

**HARD  
WATER?**

**AIR  
POLLUTION?**



**SOLVEX**  
**MAINTENANCE  
TABLETS  
OR GRAINS**

Helps Solve maintenance problems for water-cooled equipment. Protects with a protective film which increases efficiency by acting as a wetting agent.

For evaporative coolers, too, one tablet or a cupful of Maintenance Grains will improve efficiency by keeping filters soft and uniformly moist.

**SPECIAL  
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SOLVEX**

For safe, positive algae control. Destroys all algae and organic matter in cooling towers and spray ponds. Sanitizes, sterilizes, and deodorizes water-cooled systems.

Proved through the years... Ask your wholesaler or write

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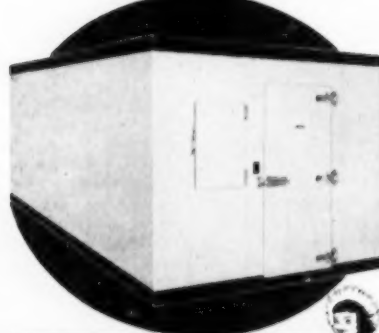
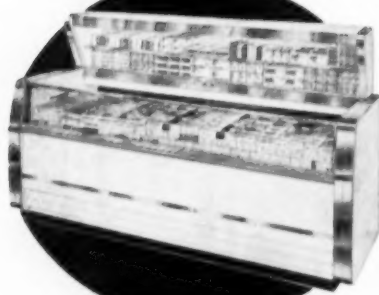
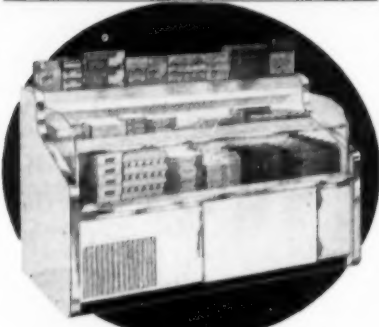
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for dependable  
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- FREEZERS
- SERVICE and SELF-SERVICE CASES
- WALK-INS
- REACH-INS
- SLIDING DOOR

many sizes and types



Write today for  
full information on the  
complete SCHMIDT line.

### The C. SCHMIDT Co.

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126



**NEW BRANCH** recently opened by Roche & Hull, air conditioning and refrigeration supplies wholesaler, to serve the Hagerstown, Md. trading area. The branch will be managed by Clarence Beagle, a native of Hagerstown. Roche & Hull, with headquarters in Baltimore, has another branch in Salisbury, Md. Complete parts stock are carried in all three locations. George J. Roche is president of the company.

## LEASING SERVICE TO GO NATION-WIDE

Leasing Corp. of America, five-year old Philadelphia company which specializes in leasing air conditioners to such customers as motels, hotels and office buildings, is expanding its activities to a nationwide basis, according to Herbert B. Wolf, president.

LCA now has representatives in

21 cities, and expects to be covering 100 cities by the end of the year. Under the company's rental plan, customers sign a lease for two, three or five years. Included in a fixed monthly charge, which varies according to installation, are any required wiring, window or building modifications, as well as complete maintenance.

Lease orders are sent by LCA

## Handy Tube Bender

### Smoothly Bends ANY

### Pipe or Tubing



$\frac{3}{8}$ " to  $1\frac{1}{8}$ " O. D.

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## Water-Cooled CONDENSERS

Widely known for fine performance and supreme dependability. Rated capacity under all operating conditions. Capacity charts available.

U.L. or A.S.M.E. tagged

$\frac{1}{4}$  Ton to 15 Ton  
FOR EVERY REQUIREMENT

## Liquid RECEIVERS

Vertical and horizontal receivers designed especially for use where space is limited. All are rugged, and moderately priced. U.L. or A.S.M.E. tagged. Constructed of heavy gauge tube with elliptical dished ends submerged—arc-welded to shells.

## Adjustable Capillary Valves

EASY TO INSTALL  
CLEANABLE  
EASY TO ADJUST  
BUILT TO LAST  
Capacities  
1/20 to 1 H.P.

Replaces high and low-side floats, capillary valves and automatic expansion valves. Operates with most refrigerants and requires no receiver in the system.

Write for our NEW Catalog Today

# STANDARD REFRIGERATION CO.

Office: 332 S. Mayne, Dept. B, Chicago 12, Ill.  
Factory: 3539 Fillmore Street, Chicago 24, Ill.

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JULY, 1957 • COMMERCIAL REFRIGERATION

representatives to Philadelphia headquarters. Air conditioners (RCA Whirlpool) are then procured from the distributor in whose territory the installation is to be made.

The company now has representatives in New York City, Chicago, Baltimore, Cleveland, Toledo, St. Louis, Boston, Hartford, Providence, Pittsburgh, Indianapolis, Miami, Pensacola, New Orleans, Birmingham, Memphis, Atlanta, Charlotte, Richmond, and Washington, D. C.

#### CONSULTING ENGINEERS' FIRM IS ORGANIZED

The formation of P. H. Ziel & Associates as consulting engineers in mechanical and electrical work has been announced by Perry H. Ziel. Headquarters are at 128 E. 6th St., Cincinnati.

In addition to the normal building functions such as plumbing, heating, ventilation, air conditioning, refrigeration and electrical work, the firm is a specialist in the application of high temperature water.

No. 8 in a series on refrigeration

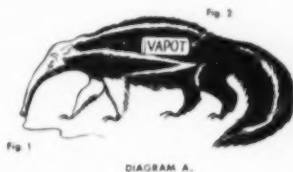


DIAGRAM A, above, represents something that from a mechanical standpoint is the golfiest contraption ever, and it works like a darn. It is known in the trade as an **aardvark**.

It is almost the first animal in the phone book but not quite because the **aani** is ahead of it, the same being an ape—more or less.

The **aardvark** is used in ant eradication. It is five feet long with its tongue in. With its tongue extended it is ten feet long from the tip of its tail to the tip of its tongue. The **aardvark** stalks through Africa and when it sees an ant—flick!—its tongue darts out and pulls in the ant. Amazing!

How does it do it? Well, the tongue (we think) is wound on a reel (Fig. 1, Dia. A) which reel is held under spring tension. When the **aardvark** has taken aim at the ant a certain very efficient and essential part automatically **snaps** and suddenly there's the ant on the tip of the **aardvark's** tongue.

The name of that efficient and essential part is on the tip of our tongue but its name escapes us at the moment. However, it corresponds to what, in refrigeration circles, is known as **VAPOT**.

In industrial cooling systems and in refrigeration generally **VAPOT** defrosts—at the right time—just as the **aardvark's** tongue flicks at the right time. **VAPOT** controls frost on coils inexpensively and positively.

If you have anything to do with cooling and/or refrigeration write for the amazing facts of **VAPOT**

### Recold

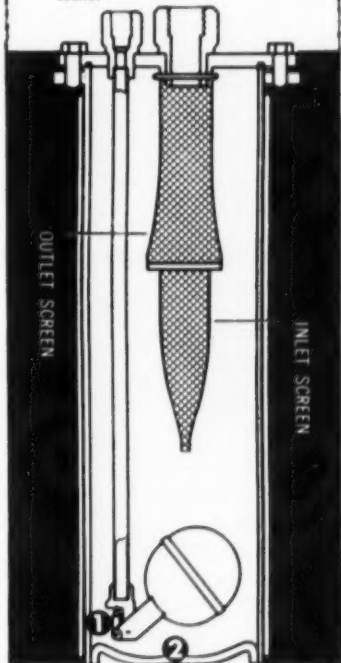
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7250 E. Slouson Ave., Los Angeles 22, Calif.  
Phone Raymond 3-3281

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## get peak refrigerating EFFICIENCY with a **TEMPRITE** OIL SEPARATOR

Oil is separated from the gas before it can get into the evaporator and is returned to the compressor automatically . . .

- Full capacity of expansion valve assured.
- Evaporator heat transfer increased.
- Constant clean oil lengthens compressor life.
- **TEMPRITE** oil separator muffles sound.



- 1 OIL RETURN VALVE: Located ABOVE the sludge reservoir.
- 2 SLUDGE RESERVOIR: Traps sludge, oil, carbon, and foreign substances, preventing their continued flow through the refrigerating system.



Complete range of capacities for refrigerants 12 and 22. ASME and UL approved.



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Describes many advantages of Temprite Oil Separators.



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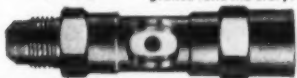
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## save service time with **LIQUID EYE**



### POSITIVE SEALING INDICATORS

"... eliminates many unnecessary trouble checks for me — one glance tells the story!"



Illustrated: 100 Series, 1/4" or 3/8" female by male flare.

- Pyrex glass, double pressure sealed at sides and ends.
- Provides instant visible check of refrigerant condition.
- Spring-loaded gaskets insure positive seal at all times.
- Unrestricted full line flow.
- Guaranteed to 500 psi.
- Precision made.

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Circle No. 111 on Reader Service Card  
& AIR CONDITIONING • JULY, 1957

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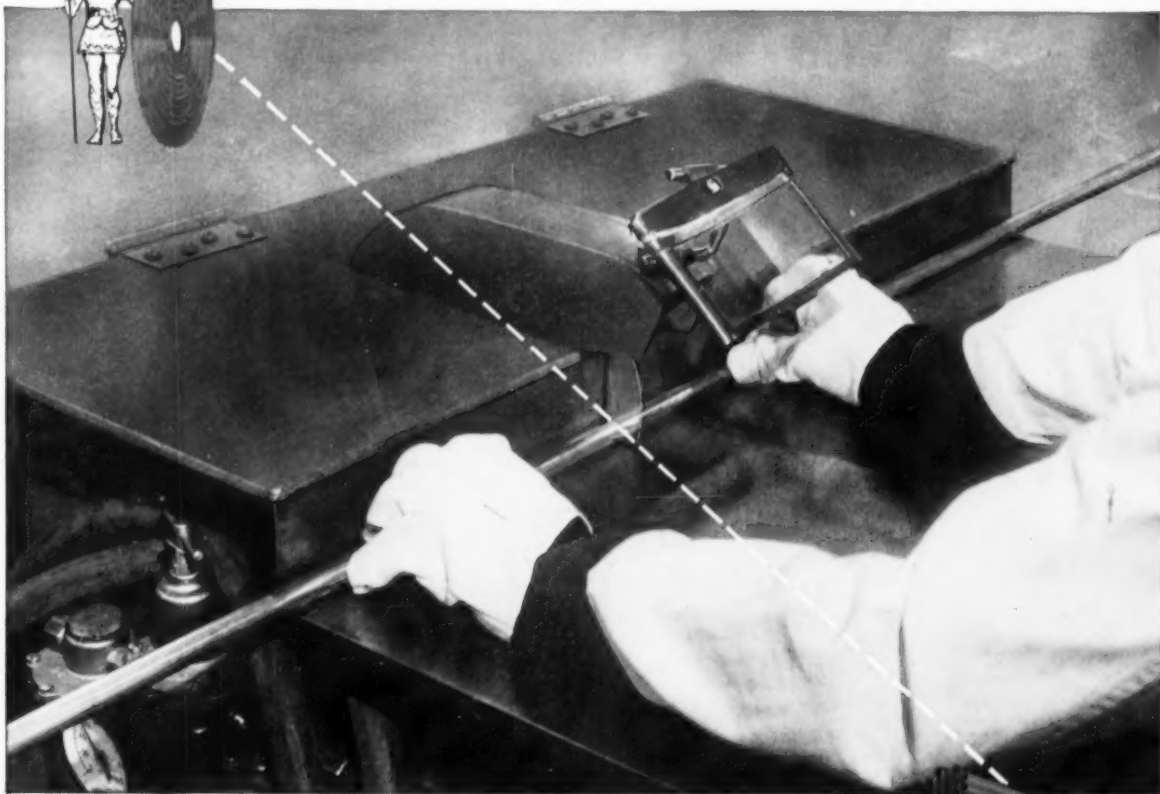
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there is a difference in copper tubing . . .



the difference in VIKING is . . .

the END that makes

a BETTER BEGINNING

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This attention to small details has made Viking copper tubing consistently superior in quality . . . and has developed exclusive features of construction that make it ideal for so many applications. As a result, more and more manufacturers of air conditioning and refrigeration units and coils are using Viking as a principal source of supply for thin-wall copper tubing.

Viking copper tubing will continue to be the result of the efforts of skilled craftsmen, seeking always to create tubing that will do the job better . . . faster . . . and at lowest cost!



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PRECISION DRAWN SEAMLESS COPPER AND ALUMINUM TUBING

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The proper kind of strength and ductility is vital in tubing used for refrigeration and air conditioning purposes. VIKING copper tubing possesses these properties to a far greater degree than other types of tubing. Its temper assures flawless fabrication.

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